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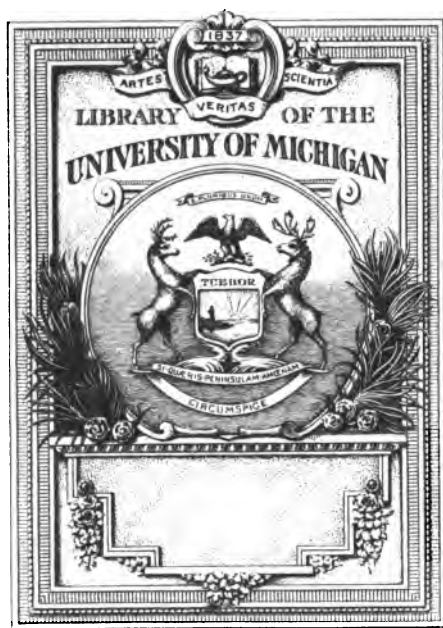
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FIELD TABLES

OF

LEPIDOPTERA

BY
WM. T. M. FORBES



WORCESTER, MASSACHUSETTS

1906



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EXPLANATION OF THE TABLES.

THESE tables are an extension and revision of similar ones published with Prof. C. F. Hodge's "Nature Study and Life." The FIELD KEY TO THE BUTTERFLIES and the KEY TO THE CATERPILLARS have not been before published. These two are especially intended for New England, but have been somewhat extended to cover a few forms that do not quite reach us. The Key to the Caterpillars is more fully explained in its special preface. I am to leave the country very soon, so that I cannot revise all these tables as fully as I should like.

IN ALL THE TABLES —

Size is in inches.

Frequency. The relative rarity of the various kinds in Southern New England is roughly represented by six grades from the rarest VR, through R, RR, RC, C, to the commonest, VC. Those not occurring in this area are marked S (southern) N (northern) and W (western).

Hibernation I. *Imago*, E. *Egg*, L. *Larva*, C. *Chrysalis*, Ad. *Adult larva*.
1, 2, 3, 4, the various stages of the larva.
 $\frac{1}{2}$, the *half-grown* larva.

THE PAPILIONOIDEA AND HESPEROIDEA —

Together include the Butterflies. In these two tables "under side" refers to the hind wing only, unless the wings are said to be alike. The fore wing is like the upper side.

SPHINGIDÆ —

Those marked *D* are dayfliers.

Probably most of the kinds are one-brooded in Northern New England and two-brooded in the South. There is considerable variation between different authors.

SATURNOIDEA —

Erebus odora does not belong to this group, but is put in on account of its unusual size.

ECONOMIC —

A number of general interest are included as well as those of Economic importance.

PAPILIONOIDEA

Names	Markings.		Size
	Upper Side	Under Side.	
<i>Semnopsyche diana</i> , <i>Diana</i> .	m. Black and tawny f. Black and blue.	Shaded, silvery and ground color.	4
<i>Argynnis cybele</i> , <i>Giant Silverspot</i> .	Tawny, black checkered.	Brown, silvery spots.	3
<i>Argynnis aphrodite</i> , <i>Aphrodite</i> .	Similar, redder . . .	Similar, red-brown	3
<i>Argynnia atlantis</i> , <i>North- ern Silverspot</i> .	Black edge	Very dark and mot- tled.	2½
<i>Brenthis myrina</i> , <i>Little Silverspot</i> .	Tawny, black checkered.	Buff, mottled, sil- ver spots.	1½
<i>Brenthis bellona</i> , <i>Marsh Fritillary</i> .	Tawny, black spot- ted.	Buff, mottled	1½
<i>Brenthis montinus</i> , <i>Moun- tain Fritillary</i> .	Tawny, black checkered.	Buff, mottled sil- very streaks.	1½
<i>Cinclidia harrisi</i> , <i>Harris' Checkerspot</i> .	Tawny, checkered	Buff and white . . .	1½
<i>Charidryas nycteis</i> , <i>Silver Crescent</i> .	Tawny and black mottled.	Silvery and buff mottled.	1½-2
<i>Phyciodes tharos</i> , <i>Pearl Crescent</i> .	Similar to last . . .	Less or no silvery . .	m. 1½ f. 1½
<i>Phyciodes batesii</i> , <i>Bates' Crescent</i> .	Similar	Yellow, no distinct marks.	m. 1½ f. 1½
<i>Fenisea tarquinius</i> , <i>Har- vester, Wanderer</i> .	Tawny, black bor- der and spots.	Brown, pale-ringed spots.	1½
<i>Pamphila palæmon</i> , <i>Arctic Skipper</i> .	Black, tawny spots	Silvery eyespots . .	1½
<i>Polygonia interrogationis</i> , <i>Semicolon</i> .	Wings much angled Tawny and black	Gray or brown, wings alike.	2½
<i>Polygonia comma</i> , <i>Brown Comma</i> .	Similar	Wings alike, brown	2
<i>Polygonia faunus</i> , <i>Green Comma</i> .	Similar	Wings alike, more mottled.	2
<i>Polygonia progne</i> , <i>Gray Comma</i> .	Similar	Gray, hind wing all one shade, wings near alike.	2
<i>Polygonia gracilis</i> , <i>Moun- tain Comma</i> .	Similar	Two shades of gray wings alike.	2
<i>Eugonia j-album</i> , <i>Comp- ton Tortoise</i> .	Similar, white spot	Brown or gray, wings alike.	2½
<i>Euptoieta claudia</i> , <i>Varie- gated Fritillary</i> .	Redbrown, checker- ed, wing rounded. Red, black check- ered.	Buff, eyespotted blurred.	1½-2½
<i>Vanessa cardui</i> , <i>Thistle B.</i>		Gray, eyespotted	2½

PAPILIONOIDEA

Freq.	Caterpillar Food	Dates for Imago	Number of Broods	Hibernation	Haunts
S...	Violet.....	July, Aug.....	1	1	Half wooded meadows
C..	Violet.....	July-Sept.....	1	1	Open wild land
C..	Violet.....	July-Sept.....	1	1	With the last
RR	Violet.....	June-Aug.....	1	1	Overgrown fields
C..	Violet.....	June, Aug., Sept.	1-3	1, ad	Meadows
C..	Violet.....	June, Aug., Sept..	3	1, ad	With the last
VR.	Unknown.....	July, Aug.....	2?	.....	Alpine gardens
R..	Aster umbellatus.	June, July.....	1	½	Meadows
VR.	Aster, etc.....	June, July.....	1	½	Meadows with the next.
VC.	Aster, etc.....	July (Aug.), Sept.	2	3, 4	Roadsides and meadows
VR.	?.....	June.....	2?	?	.....
RR	Mealy bugs on Alder	June, July, Sept..	3	C	Wooded swamps
VR.	Coarse grasses..	June, Aug.....	2?	Ad	Roadsides near woods
RC.	Elm, etc.....	July, Sept.-May..	2	2	Roads near trees
RC.	Elm, Hop, Nettle	June, Aug.-May..	2	I	Roads near trees
RR	Willow.....	All Summer.....	1	I	Roadsides, etc.
C..	Elm, Currant..	July, Sept.-May..	2	I	Roads
VR.	Unknown.....	July-June.....	1	I	Roads
RR	Willow.....	July-June.....	1?	I	Openings in woods roads, etc.
VR.	Violet, Passion flower, etc.	August.....	3	ICL	Meadows
C..	Thistle, Hollyhock, etc.	Aug., Sept.-May	2	CI	Fields

PAPILIONOIDEA — (continued)

Names	Markings		Size
	Upper Side	Under Side	
<i>Vanessa huntera</i> , <i>Painted Beauty</i> .	Similar	Two large eyespots	2½
<i>Calephelis borealis</i> , <i>North-ern Metalmark</i> .	Brown, mottled . . .	As above, lead-like spots.	1½
<i>Chlorippe clyton</i> , <i>Brown Emperor</i> .	Brown checkered . .	Gray, wings alike eyespotted.	m. 2 f. 2½
<i>Chlorippe celtis</i> , <i>Gray Emperor</i> .	Gray, checkered . . .	As above	2
<i>Euphydryas phaëton</i> , <i>Ballimore</i> .	Yellow and red black checkered.	As above	1½–2½
<i>Aglais milberti</i> , <i>Small Tortoiseshell</i> .	Wings angled, black, tawny band.	Wings alike, gray Pale band.	1½
<i>Hypatus bachmanni</i> , <i>Snout B.</i>	Wings angled, tawny, white and black.	Buff, mottled	2
<i>Anosia plexippus</i> , <i>Milkweed B.</i>	Tawny, black veins, etc.	Paler	4
<i>Basilarchia disippus</i> <i>Viceroy</i> .	Similar	Similar	3½
<i>Heodes hypophlæas</i> , <i>Common Copper</i> .	Red, black edge and spots, hind wing blackish.	Gray, black spots . .	1
<i>Chrysophanus thoë</i> , <i>Bronze Copper</i> .	m. Coppery, few marks, f. like last, tawny.	Like last.	1½
<i>Speyeria idalia</i> , <i>Dark Silverspot</i> .	Tawny, black checkered, hind wing black.	Much as above . . .	2½–4
<i>Eurymus eurytheme</i> , <i>Orange Sulphur</i> .	Orange yellow, black border.	Yellow	m. 2 f. 2½
<i>Eurema nicippe</i> , <i>Little Orange Sulphur</i> .	Orange or yellow wings thin.	Yellow	1½–2
<i>Eurymus philodice</i> , <i>Clouded Sulphur</i> .	Yellow, black border.	Yellow or greenish.	2
<i>Eurymus interior</i> , <i>North-ern Sulphur</i> .	m. Like last, f. paler or white.	Yellow	2
<i>Eurema euterpe</i> , <i>Little Sulphur</i> .	Yellow, black border, delicate.	Yellow	1½–1½
<i>Zerene cæsonia</i> , <i>Dog-face B.</i>	Yellow, very broad border.	Yellow or with pink	2½
<i>Callidryas eubule</i> , <i>Cloudless Sulphur</i> .	m. Yellow, f. very narrow border.	Yellow or spotted .	2½

PAPILIONOIDEA — (*continued*)

Freq.	Caterpillar Food	Dates for Imago	Number of Broods	Hibernation	Haunts
RC.	Everlasting, Burdock.	July, Sept.—May..	2	CI..	Fields
S...	Unknown.....	May, July.....	?	?	Woods
VR.	Hackberry.....	June, July.....	2?	½	Near swamps
W..	Hackberry.....	June, Aug.....	2	½	.....
R..	Turtlehead, later Aster, etc.	June, July.....	1	½	Meadows
R..	Nettle.....	June, Aug., Sept.—May.	3	I	Fields and roads
VR	Hackberry.....	Summer.....	4?	I	Roads and meadows
C..	Milkweed, Dogbane.	May—Oct.....	2 or more	I	Fields
C..	Willow, Poplar.	June, Aug.....	2	½	With the last
VC.	Sorrel.....	May, June, Sept..	3	C?	Everywhere open
VR	Sorrel.....	July, Aug.....	2	?	Meadows
RC,	Violet.....	July, Aug.....	1	1	Waste land
VR	Clover.....	May, July, Sept..	3	C	Open fields
VR	Cassia, etc.....	June, Aug., March	2?	I	Open fields
VC.	Clover.....	May, July, Oct., Nov.	3(4?)	L	Fields
VR	Unknown.....	July.....	1	?	Openings in woods
R..	Cassia, Clover..	July, Aug.—Apr..	2	?	Fields
VR	Clover family..	.....	Does not breed here.	breed	Fields
VR	Cassia, etc.....	August.....	2	I	Fields

PAPILIONOIDEA — (continued)

Names	Markings		Size
	Upper Side	Under Side	
<i>Pontia napi</i> , <i>Mustard white</i> .	White	White, often dark veins	2
<i>Pontia rapæ</i> , <i>Cabbage B.</i>	White, black spots.	Yellow, dark shade	2
<i>Pontia protodice</i> , <i>Checkered white</i> .	White, several black spots, f. dull.	White, etc.	2
<i>Synchlœa genutia</i> , <i>Orange-tip</i> .	Similar, wings falcate, with orange tip.	Moss-like	1½
<i>Iphiclidæ ajax</i> , <i>Zebra Swallowtail</i> .	Tailed, pale, brown striped.	Similar	2½–3½
<i>Papilio glaucus</i> , <i>Tiger Swallowtail</i> .	Yellow and black, f. sometimes black.	Similar	4
<i>Green Swallowtail</i> , <i>Lairtia philenor</i> .	Black and iridescent blue-green.	As above, red spots	3½–4½
<i>Papilio troilus</i> , <i>Blue Swallowtail</i> .	Black, m. with dull green, f. with silvery blue.	Black, red spots . .	3½–4½
<i>Papilio thoas</i> , <i>Giant Swallowtail</i> .	Blackish, yellow spots.	Yellow	4–5½
<i>Papilio polyxenes</i> , <i>Black Swallowtail</i> .	Black, yellow spots	Black, orange spots	3½–4½
<i>Basilarchia astyanax</i> , <i>Blue Emperor</i> .	Black, blue shade, no tails.	Dark, red spots . .	3–3½
<i>Basilarchia arthemis</i> , <i>White Admiral</i> .	Black, white band.	Similar, red spots .	2½–3
<i>Eu Vanessa antiopa</i> , <i>Yellow-edge</i> .	Deep brown, yellow border.	Black, pale border, wings alike	3
<i>Vanessa atalanta</i> , <i>Red Admiral</i> .	Black, red band, white spots.	Mottled, brown . . .	2
<i>Erora læta</i> , <i>Early Hair-streak</i> .	m. Black, blue hind edge, f. Blue, black outer edge.	Gray, red dots, wings alike.	1
<i>Cyaniris ladon</i> , <i>Common Blue</i> .	m. Blue, f. Blue, black border.	Gray, dark dots, wings alike.	1
<i>Nomiades lygdamas</i> , <i>Silvery Blue</i> .	m. Blue (shaded), f. Brown, blue.	Gray, black dots . .	1
<i>Rusticus scudderi</i> , <i>Scudder's Blue</i> .	m. Blue, f. Brown, blue edge.	Gray, black and red dots.	1
<i>Everes comyntas</i> , <i>Tailed Blue</i> .	Thread-like tails, m. Purple, f. Brown.	Much like last	¾–1

PAPILIONOIDEA — (continued)

Freq.	Caterpillar Food	Dates for Imago	Number of Broods.	Hibernation	Haunts
R..	Mustard, etc...	May, July, Aug...	3	C	Wild country
VC.	Cabbage, Mustard, etc.	May, July, Aug...	3	C	Everywhere in the open
R..	Mustard F.....	May, July, Sept..	3	C	Fields
VR	Mustard F. (Eats flowers and seeds.)	May.....	1	C	Open woods
VR	Papaw.....	All Summer.....	4 or more	C	Openings in woods
C..	Wild Cherry, Lilac, Tulip tree.	June, Aug.....	2	C	Near trees
R..	Dutchman's pipe.	July, Sept.-May..	2	I	Near houses
RC.	Sassafras.....	June, Sept.....	2	C	Roads and fields
R..	Orange tree, rue family.	June, Aug.....	2	C	Meadows
C..	Parsley family	June, July, Aug..	2	C	Fields and gardens
RC.	Wild Cherry, etc.	July (Sept.).....	1 or 2	½	Roads near trees
RR	Birch, etc....	July (Sept.).....	1(or 2)	½	Roads near trees
C..	Willow, Elm, etc	July, Sept.-Apr.	2	I	Roads
C..	Nettle, Elm....	July, Sept.-May..	2	C	Roads, waste land
VR	Unknown.....	May, July.....	2	?	Mountains, Woods
C..	Pea family, etc. eats flowers.	Apr., May, July..	2	C	m. Roads, f. more wild
N..	.....	April.....	.....	.....	Pine woods
N..	Lupine	June, Aug.....	2	.....	Roadsides
C..	Pea family	May, Aug., Sept..	3	L?	Fields

PAPILIONOIDEA — (continued)

Names	Markings		Size
	Upper Side	Under Side	
<i>Junonia coenia</i> , <i>Buckeye</i>	Olive, large eyespots	Marks blurred	2-2½
<i>Enodia portlandia</i> , <i>Pearly Eye</i> .	Wings long, several eyespots, brown.	Paler, hair-lines . . .	1½-2
<i>Satyrodes canthus</i> , <i>Many-eyed Satyr</i> .	Wings round, many eyespots, brown.	Paler, 2 hair-lines .	1½
<i>Cissia eurytus</i> , <i>Common Wood-nymph</i> .	Brown, few eyespots.	Like last, few eyespots.	1½
<i>Cercyonis alope</i> , <i>Blue-eyed Grayling</i> .	Brown, yellow area, two eyespots.	Many hair-lines. . .	2
<i>Cercyonis a. nephele</i> , <i>Dull-eyed Grayling</i> .	Brown, two eyespots.	Many hair-lines	2
<i>Æneis katahdin</i> , <i>Katahdin B.</i>	Translucent, one eyespot at tip.	Moss-like	1½
<i>Æneis jutta</i> , <i>Nova Scotian</i>	Dull, three spots . .	Moss-like	1½
<i>Æneis semidea</i> , <i>White Mountain B.</i>	Translucent.	Moss-like	1½
<i>Neonympha gemma</i>	Brown, two dark spots at edge of hind wing.	Silvery eyes on edge	1½
<i>Neonympha phocion</i> , <i>Georgian Satyr</i> .	Brown, no marks . .	Long, narrow spots	1½
<i>Cissia mitchelli</i>	Brown, unmarked	Many eyespots, wings alike.	1½
<i>Cissia sosybius</i>	Gray, unmarked . .	Gray, few eyespots on both wings.	1½-1½
<i>Uranotes melinus</i> , <i>Hop Hairstreak</i> .	Blackish, orange spot, thread-like tails.	Gray, dark spots, wings alike.	1½
<i>Thecla ontario</i> , <i>Ontario Hairstreak</i> .	Blackish, or with orange spot.	Gray, hair-lines, wings alike.	1½
<i>Thecla acadica</i> , <i>Acadian Hairstreak</i>	Like last	Gray, white hair-lines, wings alike	1½
<i>Thecla calanus</i> , <i>Banded Hairstreak</i> .	Like last	Brown, brown, and white hair-lines, wings alike.	1½
<i>Thecla liparops</i> , <i>Striped Hairstreak</i>	Like last	Brown, white hair-lines, wings alike	1½
<i>Thecla edwardsi</i> , <i>Edwards's Hairstreak</i> .	Like last	Much like last	1½
<i>Mitura damon</i> , <i>Olive Hairstreak</i> .	Brown or brown and buff.	Olive green, white hair-lines, wings alike.	1
<i>Callicista columella</i>	Brown, blue on hind wing.	Gray brown, black, white and orange spots, tails.	1½

PAPILIONOIDEA — (*continued*)

Freq.	Caterpillar Food	Dates for Imago	Number of Broods	Hibernation	Haunts
VR	Plantain.....		2	.....	Fields
R..	Grass.....	July.....	1	L	Wild country
RC.	Grass.....	July.....	1	L	Woods
RC.	Grass.....	June.....	1	L	Open woods
C..	Grass.....	July.....	1	L	Edge of woods
RC.	Grass.....	July-Aug.....	1	L	With the last
VR	Sedges ?		$\frac{1}{2}$	1, ad	Sedge plots on Mt. Katahdin
VR	Sedges, grass ..	June.....	1	L	Bogs
VR	Sedges.....	July.....	$\frac{1}{2}$	1, Ad	Sedge plots of Mt. Washington.
S..	Grass.....	May, July, Sept...	3	Ad ..	Near water
S..	Coarse grass...				Woods
S..	Unknown				Grass land
S..	Grass.....	July, Sept.....	2	.....	Near woods
RC.	Hop vine, bean pods, etc.	May, July.....	2	.....	Fields
VR	Unknown.....	July.....			Open woods
RR	Willow.....	July, Aug.....	1	.....	Near trees
RR	Oak.....	July, Aug.....	1		About shrubbery
RR	Oak, Willow, Apple family, etc.	July.....	1	E	About shrubbery
RR	Oak.....	July, Aug.....	1	.....	About shrubbery
R..	Red Cedar.....	May, June, Aug..	1 or 2	C	About the cedars
S..	Unknown.....	July.....			About shrubbery

PAPILIONOIDEA — (*continued*)

Names	Markings		Size
	Upper Side	Under Side	
<i>Incisalia augustus</i> , <i>Brown Elfin</i> .	Blackish, no tails..	Brown, shaded, wings alike.	$\frac{7}{8}$
<i>Incisalia irus</i> , <i>Hoary Elfin</i> .	Blackish.....	Brown shaded, wings alike.	1
<i>Incisalia henrici</i> , <i>Henry's Hairstreak</i> .	Black and reddish brown.	Brown shaded, wings alike.	1
<i>Incisalia nippon</i> , <i>Banded Elfin</i> .	Deep red-brown or blackish.	Brown, mottled, wings alike.	$1\frac{1}{8}$
<i>Strymon titus</i> , <i>Coral Hairstreak</i> .	Blackish.....	Gray, dark spots and red band, wings alike.	$1\frac{1}{8}$
<i>Epidemia epixanthe</i> , <i>Least Copper</i> .	m. Deep purple, f. Brown, black spot.	Yellowish, dark spotted.	$\frac{3}{4}$

PAPILIONOIDEA — (*continued*)

Freq.	Caterpillar Foods	Dates of Imago	Number of Broods	Hibernation	Haunts
R..	Unknown.....	May.....	1	C	Wild land
R..	Lupine flowers	May.....	1	C	Roadsides and bushes
VR	Bores in young plums	May.....	1	C	.....
RR	Pine.....	May.....	1	C	Roads near pine trees
RR	Wild Cherry, etc.	End of July.....	1	E	Open spaces in brush
R..	Unknown.....	July.....	1	E	Meadows

HESPEROIDEA

Names	Markings		Size
	Upper Side	Under Side	
Eudamus proteus, <i>Long-tailed Skipper</i> .	Black, white spots, long tails.	Similar, banded . . .	1½
Epargyreus tityrus, <i>Silver-spotted Skipper</i> .	Tawny spot	Silvery spot	2
Rhabdoides cellus, <i>Golden-banded Skipper</i> .	Tawny bar	Banded, gray	2
Achalarus lycidas, <i>Hoary-edge</i> .	Tawny spot	Pale gray border . .	1½
Pyrgus montivagus, <i>Checkered Skipper</i> .	Black and white checks and band	Pale, checkered . . .	1½
Scelothrix centaureæ, <i>Grizzled Skipper</i> .	Similar, dark	Mooselike	1½
Thanaos brizo, <i>Sleepy Dusky-wing</i> .	Mottled, gray	Dull brown, yellow spots.	1½-1½
Thanaos icelus, <i>Dreamy dusky-wing</i> .	Banded and mottled, gray.	Scattered yellow spots.	1-1½
Thanaos ausonius	Gray, row of dark bars.	Mottled	1½
Thanaos persius, <i>Persius' Dusky-wing</i> .	Brown and black, white points.	Mottled	1½
Thanaos lucilius, <i>Lucilius' Dusky-wing</i> .	Gray, mottled, white points.	Mottled	1½
Thanaos martialis, <i>Martial's Dusky-wing</i> .	Gray, mottled, white points.	Mottled	1½
Thanaos horatius, <i>Horace's Dusky-wing</i> .	Brown, mottled, white dots.	Mottled	1½
Thanaos terentius, <i>Terence's Dusky-wing</i> .	Much like last	Mottled	1½
Thanaos juvenalis, <i>Juvenal's Dusky-wing</i> .	Gray or brown, mottled, white dots.	Mottled	1½
Staphylus hayhurstii, <i>Hayhurst's Skipper</i> .	Brown, banded, wings wavy.	Mottled	1
Thorybes bathyllus, <i>Southern Dusky-wing</i> .	Dark, white dots. . .	Banded brown . . .	1½
Cocceius pylades, <i>Northern Dusky-wing</i> .	Dots minute, like last.	Like last	1.6
Pholisora catullus, <i>Sooty-wing</i> .	Black, white dots .	Brown-black	1
Amblyscirtes eos	Dark, white dots on both wings.	Brown, shaded . . .	1
Amblyscirtes vialis, <i>Road-side Skipper</i> .	Dots on fore wing.	Shaded	1

HESPEROIDEA

Freq.	Caterpillar Foods	Dates for Imago	Number of Broods	Hibernation	Haunts
VR	Pea family . . . . .	.....	1?	.....	Hot sun.
C . .	Locust, Wistaria etc.	June, July	1	C	Wild country
S . .	Convolvulus F.	April . . . . .	.....	.....	.....
R . .	Desmodium, etc	June	1	C	Wild Country
W . .	Mallow family . . . . .	.....	.....	C?	Roads
VR	Unknown	May	1	.....	.....
RC.	Oak, Galactia . .	May-June	1	Ad	Openings in woods
RC.	Poplar	June	1	Ad	Openings in woods
VR	Unknown	May . . . . .	.....	.....	.....
RC.	Willow, Poplar	May, June, July	1(2)	Ad	Shaded roads
RR	Columbine	May, July, Sept. .	1, 2, 3	Ad	Fields
RR	Unknown	June, Aug. . . . .	.....	Ad	Open woods
R . .	Wistaria?	May, July	2	.....	Open woods
VR	.....	—, Aug.	2?	.....	.....
RC.	Oak	May, Aug.	2	Ad	Open woods
S . .	Pigweed . . . . .	.....	several	.....	Woods
VR	Pea family	July	1	Ad?	.....
C . .	Clover, Pea	June, Aug.	2 and 1	C?	Fields and roadsides
RR	Pigweeds	May, June, Aug . .	2	Ad	Fields
S . .	.....	.....	.....	.....	.....
RR	Grasses	June, Aug.	2	Ad?	Roadsides and fields

HESPEROIDEA — (continued)

Names	Markings		Size
	Upper Side	Under Side	
Amblyscirtes samoset, <i>Pepper and Salt Skipper</i>	Like last.	Outer part paler . .	1
Atrytonopsis hianna, <i>Dusted Skipper</i> .	Olive, white dots . .	Paler than above, shaded.	1½
Erynnis comma, <i>Canadian Skipper</i> .	Tawny marked	Olive green, white dots.	1½
Erynnis uncas, <i>Unacus</i> . .	m. tawny marked, f. white spots.	Olive and silvery spotted.	1½
Poanes massasoit, <i>Mulberry-wing</i> .	m. Black, f. tawny spots.	Yellow, dark border	1½
Atrytone hobomok, <i>Hobomok Skipper</i> .	Tawny marks or f. white spots.	Yellow, purplish border or mottled	1½
Polites coras, <i>The Yellow Spot</i> .	Tawny marks	Yellow, dark border	1
Phycanassa viator, <i>Broad-winged Skipper</i> .	m. Tawny, dark border, f. pale spotted.	Pale, dark border .	1½
Limochores pontiac, <i>Pontiac Skipper</i>	Similar to last, f. darker.	Yellowish, tawny border.	1½
Atrytone zabulon	m. With tawny, f. white-spotted.	Yellow, dark bar . .	1½
Atalopedes campestris, <i>The Sackem</i> .	Like <i>pontiac</i> , m. large black spot.	m. yellow, unmarked, f. dull.	1½
Hylephila phylæus, <i>Fiery Skipper</i> .	Tawny marked	Yellow, brown dots	1½-1½
Epiphyas carolina, <i>Carolina Skipper</i> .	Tawny dots	Yellow, brown dots	1
Thymelicus brettus, <i>Whirlabout</i> .	m. Mostly tawny, f. dark, pale dots.	Yellow, dark edge and spots.	m. 1½ f. 1
Anatrytone vitellius, <i>Iowa Skipper</i> .	Tawny, dark border	Tawny	m. 1½ f. 1½
Anatrytone delaware, <i>Delaware Skipper</i> .	Tawny, dark border	Tawny	m. 1½ f. 1½
Anatrytone arogos	Tawny, dark border	Tawny	
Erynnis sassacus, <i>Indian Skipper</i> .	Tawny marks	Tawny, marked . .	1½
Paratrytone aaroni, <i>Aaron's Skipper</i> .	Tawny, dark border	Dull tawny	m. 1 f. 1½
Ancyloxipha numitor, <i>Bordered Skipper</i> .	m. tawny, dark border. f. forewing d.	F. w. black, h. w. orange.	¾-1
Ancyloxipha longleyi . . .	Like last, bluish . .	Like last	1
Erynnis attalus, <i>Attalus' Skipper</i> .	Pale band, etc	Dull red, pale spots	m. 1½ f. 1½
Erynnis leonardus, <i>Leonard's Skipper</i> .	m. With tawny, f. Yellow band.	Brick red, white spots.	m. 1½ f. 1½

HESPEROIDEA — (continued)

Freq.	Caterpillar Foods	Dates for Imago	Number of Broods	Hibernation.	Haunts
R..	Grasses.....	June, July.....	1	.....	Openings in woods
R..	Unknown.....	June.....	1?	.....	Openings in woods
N..	Grass.....	Aug.....	?	?	Roadsides
S..	.....	.....	.....	.....	.....
R..	.....	June, July.....	2	.....	Swamps
C..	Grass.....	June.....	1	AdC	Meadows, etc.
VC.	Some Grass....	June, Aug.....	2	.....	Fields and roadsides
S...	Unknown.....	.....	.....	.....	.....
R..	.....	July.....	.....	.....	.....
S...	.....	.....	.....	.....	.....
S...	Grass.....	Apr., July, Sept..	3?	.....	.....
S...	.....	.....	.....	.....	.....
S...	.....	.....	.....	.....	.....
VR	Grass.....	.....	.....	.....	.....
S...	.....	.....	.....	.....	.....
RR	Grass.....	July.....	1	.....	Wooded roads
S...	.....	.....	.....	.....	.....
RC.	Grass.....	June.....	1	.....	Fields
S...	.....	.....	.....	.....	.....
C..	Grass.....	June, Aug., Aug.— Sept.	3	AdC	Fields and meadows
W..	.....	.....	.....	.....	Fields
VR	.....	.....	.....	.....	.....
C..	Grass.....	Sept.....	1	1	Fields and roadsides

HESPEROIDEA — (continued)

Names	Markings		Size
	Upper Side	Under Side	
<i>Padraona dara</i>	Tawny marks.....	<i>Tawny brown</i> , yellow spots.	
<i>Thymelicus mystic</i> , <i>Long-dash</i> .	Tawny marks.....	Yellow-brown, large yellow spots.	1½
<i>Limochores palatka</i> , <i>Palatka Skipper</i> .	Tawny marks.....	Tawny, two yellow bars.	1½–2
<i>Erynnis metea</i> , <i>Cobweb Skipper</i> .	Tawny or white bands.	<i>Brown and silver</i> spotted.	1½
<i>Stomyles textor</i> , <i>Woven-winged Skipper</i> .	White dots.....	White lines, dark..	1½
<i>Calpodus ethlius</i> , <i>Brazilian Skipper</i> .	White spots, hind wing lobed.	White spots.....	2
<i>Oligoria maculata</i> , <i>Twin-spot</i> ..	White points.....	Few white dots....	1½–1½
<i>Prenes panoquin</i>	White triangles....	Yellow veins and white spots.	
<i>Limochores dion</i>	About half tawny .	Fuscous, unmarked	
<i>Limochores arpa</i>	Tawny costa.....	Fuscous.....	
<i>Limochores bimacula</i>	m. Tawny costa; f. pale spots.	Coppery shade pale veins.	
<i>Thymelicus cernes</i> <i>Tawny-eyed Skipper</i> .	m. Tawny costa; f. less or no tawny.	Dull, faint dots....	m. 1 f. 1½
<i>Thymelicus manataaqua</i> , <i>Crossline Skipper</i> .	Much like last.....	Dots clearer.....	1½
<i>Catia druryi</i> , <i>Volcanic Skipper</i> .	Tawny or white dots.	Purple-brown, faint bands	1½
<i>Euphyes verna</i> , <i>Little Glass-wing</i> .	m. large white spots, f. tiny spots.	Like last.....	1½
<i>Euphyes metacomet</i> , <i>Dun Skipper</i> .	m. unmarked, f. tiny spots.	Like last.....	1½
<i>Prenes ocola</i>	White triangles ...	Warm brown, faint marks.	1½
<i>Lerodea osyka</i>	Small dots.....	Gray, brown streaked.	
<i>Stomyles fusca</i>	Small spots.....	Dull unmarked....	
<i>Lerema accius</i>	White dots.....	Like last.....	1½
<i>Pamphila palæmon</i> , <i>Arc-tic Skipper</i> .	Large tawny spots	Silvery spots, buff	1½

HESPEROIDEA — (continued)

Freq.	Caterpillar Foods	Dates of Imago	Number of Broods	Hibernation.	Haunts
S ..	.....	.....	.....	.....	.....
RC.	Grass	June, Aug	2	$\frac{1}{2}$	Fields and roadsides
S ..	.....	.....	.....	.....	.....
R..	Grass?.....	June.....	1	.....	Shrubbery
S ..	.....	.....	.....	.....	.....
VR	Canna.....	Summer.....	several	.....	.....
S ..	Grass .....	.....	.....	.....	.....
S ..	.....	Early July.....	.....	.....	.....
S ..	.....	.....	.....	.....	.....
R..	Unknown.....	July.....	1	C?	Meadows
C ..	Grass	June, Aug., Sept.	2	C	Fields and roadsides
RC.	Grass	July.....	1?	.....	Meadows
R..	Grass	July.....	1	L	.....
R..	Grass	July.....	1	.....	Bright sunshine
RR	.....	July.....	1.....	.....	Fields and flowers
S ..	.....	.....	.....	.....	.....
S ..	.....	.....	.....	.....	.....
S ..	.....	.....	.....	.....	.....
VR	Grasses.....	Apr. —.....	3?	C?	.....
VR	Coarse Grasses	June, Aug	2?	Ad	Roadsides near woods

SPHINGIDÆ

Names	Markings		Size
	Fore Wing	Hind Wing	
<i>D. Hemaris diffinis</i> , <i>Bumble-bee Clearwing</i> .	Clear, border black	Same	2
<i>D. Hemaris thysbe</i> , <i>Common Clearwing</i> .	Clear, border red-brown.	Same	2½
<i>D. Hemaris gracilis</i>	Like last	Same	2
<i>Paonias excæcatus</i> , <i>Blind-eyed Sphinx</i> .	Scalloped, brown . .	Pink, blue-pupiled eyespot.	2½
<i>Cressonia juglandis</i> , <i>Walnut Sphinx</i> .	Scalloped, buff . . .	Pale buff	2½
<i>Marumba modesta</i> , <i>Modest Sphinx</i> .	Olive shades, wavy	Deep red	4½
<i>D. Amphion nessus</i>	Deep brown, irregular.	Deep red band . . .	2½
<i>Smerinthus jamaicensis</i> , <i>Twin-spotted Sphinx</i> .	Gray, irregular . . .	Pink, double eye-spot.	2½
<i>Smerinthus cerysii</i>	Irregular, gray . . .	Pink, black-pupiled eyespot.	3½
<i>Deidamia inscripta</i>	Brown banded, irregular.	Tawny	2
<i>Sphecodina abbotii</i> , <i>Abbot's Sphinx</i> .	Dark brown, irregular.	Brown, yellow costa	2½
<i>Paonias myops</i> , <i>Chocolate Eyed Sphinx</i> .	Deep brown	Yellow eyespot	2½
<i>Triptogon lugubris</i> , <i>Mourning Sphinx</i> .	Black-brown, irregular.	Same	2½
<i>Deilephila gallii</i> , <i>Dark-veined Deilephila</i> .	Brown, buff band . .	Pink center	3
<i>Deilephila lineata</i> , <i>White-lined Sphinx</i> .	Same, white veins.	Same	3½
<i>Phlegethontius cingulata</i> , <i>Convolvulus Sphinx</i> .	Gray-brown mottled, body with pink.	Black, pink and white bands.	4
<i>Pholus vitis</i> , <i>Painted Sphinx</i> .	Brown, pale bands	Pink border, black and pale.	3½
<i>Pholus linnei</i>	Same	Same, pink anal spot only.	4
<i>Pholus achemon</i>	Gray-brown, brown spots.	Pink except border	4
<i>Ampelophaga chærilis</i> . . .	Falcate, red-brown	Tawny	2½
<i>Ampelophaga myron</i> , <i>Green Grape-vine Sph.</i>	Falcate, greenish . .	Tawny	2½
<i>Ampelophaga versicolor</i> . .	Lanceolate, green . .	Bright tawny	3

SPHINGIDÆ

Freq.	Caterpillar		Dates	Broods
	Markings	Foods		
RR	White stripes	Bush Honeysuckle, Snowberry.	July, Aug., May..	2
RC	White stripes	Viburnum, Snowberry.	July, Aug., May..	2
VR	Unknown			
RC	Rough, green, white slant-lines.	Wild Cherry, etc. .	June, July	1
R..	Rough, green, white slant-lines.	Walnut, etc.	June, July	1
RR	Same, horn short	Poplar	June	1?
RC	Yellow stripes and	Grape?	June	1
RC	Rough, green, white slant lines.	Wild Cherry	June-Aug.	1 and 2?
VR				
R..	Green, white stripe and 8 obliques.	Grape	June	
C..	Checkered, eye-like wart on tail.	Grape, Ampelopsis .	May, June	
RC	Green, rough, red spots and white obl.	Wild Cherry	June-Aug.	1?
S..				
RR	Blackish, yellow spots	Willowherb	June, Sept.	2
C..	Checkered or green . . .	Various	June, Sept.	2
VR	Shaded slant lines, black spot and shades.	Morning Glory	Aug	2?
VR	Black and white, red obliques, no horn.	Grape		
VR	Unknown			
RC	Long oval white spots, eye-like wart.	Grape, Ampelopsis.	June-July	
RR	White stripe and obliques, swollen.	Azalea, Viburnum..	June, Aug.	1 and 2
RC	Similar	Grape F.	June, July, Aug..	1 and 2
R..	Similar	Button Bush		

SPHINGIDÆ — (continued)

Names	Markings		Size
	Fore Wing	Hind Wing	
<i>Lepisesia gauræ</i>	Falcate, brown . . .	Tawny, dark border	2
<i>Dilophonota ello</i>	Pale gray	Tawny	3½
<i>Dilophonota obscura</i>	Pale gray	Tawny	2½
<i>Paonias astylus</i>	Inner edge notched, tawny, shaded.	Orange and yellow eyespot.	2½
<i>D. Lepisesia flavofasciata</i>	Brown, pale band	Black, yellow band	1½
<i>Theretra tersa</i>	Buff lanceolate, fine slant-lines.	Black, yellow tri- angles.	3
<i>Sphinx luscitiosa</i>	Brown, fine-lined .	Yellow, black bor- der.	3
<i>Arges labruscæ</i>	Olive green	Black, mottled . . .	5
<i>Pholus pandorous</i>	Olive shades, some pink.	Same	4½
<i>Phlegethontius quinque- maculatus, Five-Spotted Sphinx.</i>	Pale gray, fine lines, body with yellow	White, black lines	5
<i>Phlegethontius sexta, Carolina Sphinx.</i>	Brown, mottled, body with yellow	Gray, white bands .	5
<i>Phlegethontius rusticus, Three-spotted Sphinx.</i>	Dark brown, wave- lined.	Black, white mot- tled.	5
<i>Sphinx chersis, Great Ash Sphinx.</i>	Ash gray, fine lines	Black, blurred white bands.	5
<i>Sphinx kalmiæ, Laurel Sphinx.</i>	Brown, fine lines .	Black, white bands	4½
<i>Sphinx drupiferarum, Plum-tree Sphinx.</i>	Dark gray, pale costa.	Black, white bands	4
<i>Sphinx gordius</i>	Gray, wings shorter otherwise like chersis	thorax dark	3½
<i>Sphinx canadensis</i>	Similar, bands of	hind wing clear . .	3½
<i>Sphinx eremitus</i>	Short; brown, fine lines.	Black, white lines .	3½
<i>Dolba hylæus, Black-alder Sphinx.</i>	Black and white . .	Black, white lines .	2½
<i>Ellopos tantalus</i>	Black, white lines .	Black, white spots .	2½
<i>Chlænogramma jasmin- earum, Jessamine Sph.</i>	Pale gray	Bright brown	4
<i>Ceratonia undulosa, Elm- tree Sphinx.</i>	Pale gray, distinct wavy lines.	Pale, lined	3½
<i>Ceratonia amyntor, Four- horned Sphinx.</i>	Brown, fine lines . .	Brown	4½
<i>Ceratonia catalpæ, Ca- talpa Sphinx.</i>	Gray, very smooth	Grayish	3½

SPHINGIDÆ — (*continued*)

Freq.	Caterpillar		Dates	Broods
	Markings	Food		
S...				
VR	Mottled, black spot ..	Psidium		
S...	Black spot, short horn ..			
VR	Green, red spots, white obliques, rough.	Blueberry, Huckleberry.	July	
VR			June	
VR	Swollen, eyespot	Spermacoce		
VR	Green obliques	Willow, etc.		
S...	Checkered, white eye-like wart.			
C ..	Oval white spots, dark eye-like wart.	Grape, etc.	June	1
C ..	Shaded obliques and stigmatal.	Potato F.	June, Sept	1 and 2
RR	Shaded obliques and fine black rings.	Potato F.		1?
VR		Potato F.		
RC.	Pale green, white obliques.	Ash, Lilac	June-Aug.	1 or 2?
RC.	Deep blue and yellow obliques.	Ash, Lilac, Laurel	July, Aug.	1 or 2?
RC.	Red-purple and white obliques.	Plum, Cherry, etc.	June, July	1?
C ..	Violet-shaded oblique	Apple, Cherry ...	June-July	1
VR		Rubus	July	
R ..	Horn small, black ...	Mints		
RR	Crimson shaded obliques.	Black alder, Sweet fern.	July, Aug.	1?
VR	Unknown			
VR				
RC.	Pale obliques, usually blue-green	Elm, Ash	Aug.	1?
C ..	Rough, four small horns, obliques raised.	Elm	June, July	1
S...	Checkered, horn slender.	Catalpa	Summer	3

SPHINGIDÆ — (*continued*)

Names	Markings		Size
	Fore Wing	Hind Wing	
Lapara coniferarum.....	Gray.....	Dull.....	2½
Lapara bombycoides.....	Gray, wave-lines ..	Dull.....	2½
Sphinx plebeia.....	Pale gray, fine lines	Blackish.....	2½ ...
Sphinx cupressi, <i>Cypress</i> <i>Sphinx.</i>	Dull gray, two black bars.	Blackish.....	2½

SPHINGIDÆ — (*continued*)

Freq.	Caterpillar		Dates	Broods
	Markings	Foods		
VR	Striped or checkered, no horn.	Pine .....	.....	.....
VR	Same	Pine .....	.....	.....
R..	Obliques pale, black edged.	Lilac, Trumpet creeper.	.....	.....
S..	Checkered	Cypress .....	.....	.....

SATURNOIDEA

Names	Markings		Size
	Male	Female	
<i>Philosamia cynthia</i> , <i>Olive Emperor M.</i>	Olive, marbled, clear reniform discal.	Similar.....	5½
<i>Samia cecropia</i> , <i>Cecropia Emperor.</i>	Blackish, red band, etc.	Duller.....	6
<i>Samia columbia</i> , <i>Canadian Emperor M.</i>	Red-brown, no red band.	Similar.....	5
<i>Callosamia angulifera</i>	Black, white border and discal spots	Red-brown and buff, etc.	m. 4 f. 5
* <i>Callosamia promethea</i> , <i>Promethea.</i>	Black, pale border.	Red-brown, and brown mottled.	m. 4 f. 4½
<i>Tropæa luna</i> , <i>Empress M.</i>	Yellow-green, long tails.	Clearer, paler....	4-6
<i>Telea polyphemus</i> , <i>American Silkworm.</i>	Buff, large eyespot, discals clear.	Usually less reddish	5-6
<i>Hyperchiria io</i> , <i>Corn Emperor M.</i>	Yellow, eyespot on hind wing.	Fore wing dull, brown colors.	m. 2½ f. 3
<i>Hemileuca maia</i> , <i>Buck M.</i>	Gray, white median band.	Similar.....	3½
<i>Citheronia regalis</i> , <i>Royal, Walnut M.</i>	Olive red and orange spots.	Similar.....	6
<i>Citheronia sepulcralis</i> , <i>Royal Pine M.</i>	Blackish, blurred marks.	Similar.....	4
<i>Basilona imperialis</i> , <i>Imperial M.</i>	Yellow, maroon shades.	Yellow, maroon band.	m. 4½ f. 5½
<i>Anisota rubicunda</i> , <i>Rosy Forest M.</i>	Pink and yellow...	Similar.....	2
<i>Anisota stigma</i> , <i>Spotted Forest M.</i>	Yellow, peppered with dark.	Similar.....	2½
<i>Anisota senatoria</i> , <i>Senatorial Forest M.</i>	Translucent red-brown.	Yellow, brown peppered.	m. 2 f. 2½
<i>Anisota virginensis</i> , <i>Pellucid Forest M.</i>	Like last.....	Brownish, not peppered.	m. 2 f. 2½
(<i>Erebus odora</i> , <i>Black Witch</i>).	Black and brown.	Similar, white outer band.	4½-6

* The male flies by day.

SATURNOIDEA

Freq.	Caterpillar			Imago Dates	Number of broods
	Markings	Food	Dates		
S..	Many silvery horns..	Ailanthus.....	Aug., Sept..	June.....	1
RC.	Four red, two orange, yellow and blue warts.	Apple, Elm, etc..	Sept.....	June, July..	1
VR	Six red, yellow, and white warts.	Larch.....	Sept.....	June, July..	1
R..	Four red, one yellow wart, yellow stig-matal.	Tulip tree, etc....	Sept.....	June, July..	2?
C..	Similar, no stigmatal	Tulip tree, Wild Cherry, etc.	Sept.....	June, July..	1
RC.	Hair, white crosslines	Chestnut, Walnut, etc.	July-Sept. .	June-Aug..	1?
C..	Hair, white slant lines	Maple, Oak, etc..	Aug., Sept..	June, July..	1
RC.	Green spines.....	Various.....	Aug., Sept..	June-Aug...	1
RR	Black spiny.....	Oak, Birch.....	July.....	Aug., Sept..	1
VR	Long orange horns...	Walnut, etc.....	Sept.....	June.....	1
VR	Long orange horns...	Pine.....	Sept.....	June.....	1
RC.	Hair yellow, short horns.	Maple, etc.....	Sept.....	June.....	1
RC.	Green striped, two horns.	Maple.....	Aug.....	June.....	1
RC.	Brownish, two horns.	Oak.....	Aug.....	June.....	1
RC.	Black and yellow striped, two horns.	Oak.....	Aug.....	June.....	1
RC.	Pink and gray striped, two horns.	Oak.....	Aug.....	June.....	1
VR	Gray semi-looper....	.....	.....	.....	.....

ECONOMIC, ETC.

Names	Moth		
	Description	Dates	Size
<i>Tent Caterpillar</i> , <i>Malacosoma americana</i> .	Bright brown, two white lines.	July.....	m. 1½ f. 1½
<i>Forest Tent Caterpillar</i> , <i>Malacosoma disstria</i> .	Pale brown, two dark lines.	July.....	m. 1½ f. 1½
<i>Fall web-worm</i> , <i>Fire worm</i> , <i>Hypantria textor</i> .	White.....	July.....	1½-1¾
<i>Yellow Bear</i> , <i>Diacrisia virginica</i> .	White, yellow on body.	June, Sept. 2	
<i>Black-tipped bear</i> , <i>Isia isabella</i> .	Buff.....	June-July..	2½
<i>Red-headed tussock</i> , <i>Hemerocampa leucostigma</i> .	m. Dull gray; f. white, wingless.	.....	m. 1 f. ½ long
<i>Gipsy</i> , <i>Porthetria dispar</i>	m. Brown, f. white, black marked.	.....	m. 1½ f. 2
<i>Browntail</i> , <i>Euproctis chrysorrhea</i> .	White, yellow tuft on tail.	.....	1½
<i>Eightspotted Forester</i> , <i>Alypia octomaculata</i> .	Black, eight yellow spots.....	May, July..	1½
<i>Red-humped caterpillar</i> , <i>Schizura concinna</i> .	Brown, shaded.....	June, July..	1-1¾
<i>Yellow-necked Apple worm</i> , <i>Datana ministra</i> .	Buff, brown shade	June, July..	2½
<i>Cut-worms</i> , Noctuidæ	Of various dull colors	Summer....	1½-2
<i>Zebra Cabbage worm</i> , <i>Meimastura picta</i> .	Liver color	June, July..	2
<i>Clover Looping Owlet</i> , <i>Drasteria erechtea</i> .	Gray, two dark bars, m; f. fainter marks.	.....	.....
<i>Under-wings</i> , <i>Catocala</i> sp...	Fore wing barklike, hind wings black and bright.	July, Aug. .	2-4
<i>Spring Cankerworm</i> , <i>Anisophteryx vernata</i> .	Silky, gray, f. wingless.	Nov., March	m. 1½ f. ½ long
<i>Fall Cankerworm</i> , <i>Paleacrita vernata</i> .	Silky, gray, f. wingless.	Nov., March	m. 1½ f. ½ long
<i>Chain-dotted Geometer</i> , <i>Cingilia catenaria</i> .	White, two rows of black dots.	Sept.....	1½
<i>Scallop-shell Moth</i> , <i>Hydria undulata</i> .	Gray, many wavelines.	July, Aug	1½
<i>Grape Procris</i> , <i>Harrisina americana</i> .	Black, orange neck .	.....	1½
<i>Lime Leaf-roller</i> , <i>Pantographa limata</i> .	Cream, brown lines and shades.	July.....	2

ECONOMIC, ETC.

Number of broods	Hibernation stage	Caterpillar		
		Description	Food	Dates
1	E	Blue marked, buff hair, white line	Wild Cherry, Apple.	June
1	E	Pale blue marked, buff hair, white spots.	Maple, etc.	June
2?	C	Gray or brown, hairy...	Apple, Walnut, etc.	Aug.
1?	C	Hairy, yellow or tawny..	Low plants.	All summer
1?	L	Hairy, tawny, black at ends.	Herbs.	Sept.-May
2-3	E	Tufted, yellow, red head	Apple, etc.	June, Aug.
....	E	Hairy, blue and red warts	Oak. ....	.....
1	L	Tufted hair stinging	Trees.	Sept.-May
2	C	Humped, striped cross-wise with black and red	Grape.	June, Sept.
1	C	Gray, striped, red hump, black horns.	Apple, willow, etc.	Aug., Sept.
1	C	Black and yellow striped tail in air.	Apple, etc.	Aug.
1	L	Gray, faint marks, greasy	Various.	Sept.-July
1	C	Gaily striped.	Herbs.	Sept.
....	C	Like dead grass, a semi-looper.	Clover. ....	.....
1	L	Bark-like, semi-loopers..	Forest trees.	Sept.-June
1	CE	10-legged brown inch-worm.	Apple.	June
1	CE	12-legged brown inch-worm.	Apple, Elm.	June
1	E?	Yellow inch-worm.	Raspberry, Blackberry.	July
1	C	Black inch-worm, yellow below.	Wild Cherry.	Sept.
....	....	White, black dotted slug caterpillar.	Grape. ....	.....
1	L	Green leafroller.	Linden.	Aug., Sept.

COLOR KEY TO BUTTERFLIES

PREDOMINANTLY WHITE

Fore wing orange-tipped. *Euchloë genutia*, m.

No bright on fore wing.

Black border —

Silvery eyespot below.

Hind wing large, border on fore wing only. *Eurymus interior*.

Hind wing normal, black border usually on both wings.

No silvery eyespot, dark spots. *Eurema euterpe alba*. *Eurymus philodice pallidice*.

Black border and spots, hind wing black. *Heodes hypophlæx fuliolus* (extreme form).

Black tip to wing, central ray on hind wing below —

One spot on fore wing besides. *Pontia rapæ*. Male.

Two spots on fore wing above. *Pontia rapæ*. Female.

No spots on fore wing above. *Pontia rapæ immaculata*.

Fore wing white or shaded, wings below gray veined or unmarked.

Pontia napi.

Fore wing checkered or spotty.

Green, moss-like below. *Euchloë genutia*.

No green, white and gray marks. *Pontia protodice*. Male.

BLACK OR DARK AND WHITE

Large, median white band. *Basilarchia arthemis*.

Large, black veins and white spots. *Amosia plexippus fumosus*.

Not over 2 inches in expanse.

Checkered, or with many large white spots —

Moth, with no club on feelers. *Rheumaptera hastata*.

Butterfly, feelers clubbed.

Median white band. *Hesperia montivaga*.

No such band. *Hesperia centaureæ*.

Few or small, usually translucent spots. *SKIPPERS*.

Two big spots on each wing. *Pyrausta funebris* (moth).

Two spots on fore wing and one on hind wing. *Desmia macu'alis* (moth).

One white bar on fore wing only. *Odezia alborittata* (moth).

BLACKISH, UNMARKED, OR DARK-MARKED

A deeper black, discal streak. *Euphyes metacomet*. Male.

Body metallic blue. *Ctenunucha virginica*. Moth.

Wings narrow, hind one translucent — wasplike.

Brownish black. *Scepsis fulvicollis*. Moth.

Greenish black. *Harrisina americana*. Moth.

Eyespots below, and darker spots above. *Satyrs*.

Wings broad, small delicate butterflies. *Theclids*, *Epidemia*.

Many fine lines below. *Cercyonis alope nephele*.

Moss-like below, border paler

Three dark spots of fore wing above. *Eneis jutta*.

1 eyespot at tip of fore wing. *Eneis katahdin*.

A few hair-lines below

Two large eyespots on hind wing above. *Cissia eurytus*.

Many eyespots on hind wing.

Wings short, rounded. *Satyrodes canthus*.

Wings longer, triangular, scalloped. *Debis portlandia*.

Yellowish below, spotted. *Epidemia epixanthe*.

Gray or dark below.

Threadlike tails

Olive green shades below. *Mitura damon*.

Clear slate gray.

Brown, white-encircled spots. *Thecla acadica*.

Dark line, white outwardly. *Uranotes melinus*.

Spotted, wings short. *Everes comyntas*. Female.

Brown.

Dark line shaded outwardly with white. *T. ontario*.

Dark spots nearly surrounded with white. *T. edwardsii*.

Paired white lines, sometimes dark between.

Lines more broken and evenly spaced. *Theclaliparops*.

Lines continuous and in pairs. *T. calanus*.

Wings scalloped

Mottled, white line near base. *Incisalia niphon*.

Less brightly mottled, no such white line.

Outer part of wings pale, hoary.

Center of wings above tawny. *I. henrici*.

Wings all fuscous above. *I. irus*.

Wings all red-brown below. *I. augustus*.

Wings even-edged, gray, spotted below. *Strymon titus*.

BLACK WITH MORE OR LESS BRIGHT COLOR

Black and blue, blue mostly on hind wing near border

Swallowtail.

Clear blue, and yellow spots. *Papilio asterias*.

Yellow much more conspicuous than blue. Males.

Yellow spots small, and blue strong. Females.

Pale gray-blue, silvery. *Papilio troilus*. Female.

Brilliant peacock blue, white spots. *Lærtias philenor* var.

Not tailed.

Expanse 3 inches.

Red spots on hind wing above. *Basilarchia proserpina*.

No red above. *Basilarchia astyanax*.

Blues.

Expanse 1 inch.

Thread-like tails, deep purple-blue. *Everes comyntas*. Male.

No tails.

Two rows of red dots below, drab-gray. *Erora læta*.

Mostly blue. Female.

Mostly black. Male.

A marginal row of red dots below, black spotted. *Rusticus scudderi*.

Pale blue. Male.

Deep blue, heavily black-bordered. Female.

No red below (Clear blue, *males*, much brown, or black edge *females*).

Brown with large white spots below. *Nomiades couperi*.

Gray.

Central brown spot below. *Cyaniris ladon lucia*.

Dark border below. *Cyaniris ladon marginata*.

Conspicuous black dots

Pale silvery blue, spots very large in an outer row.

Nomiades lygdamus.

Brilliant sky-blue, spots scattered and smaller. *Cyaniris ladon violacea*.

Minute black dots.

Smaller, summer form. *Cyaniris ladon neglecta*.

Larger June form. *Cyaniris ladon ladon*.

Black, and yellow or pale —

Narrow yellow border.

Wings angled, border bright. *Euvanessa antiopa*.

Wings rounded, border clay-color. *Callosamia promethea*.

Yellow area on fore wing, with eyespots. *Cercyonis alope*.

Area clear ochre yellow. *C. a. alope*.

Area blurred and orange-yellow. *C. a. maritima*.

Yellow spotted, or pale spotted.

Two spots on fore wing.

Spots on fore wing yellow.

One white spot on hind wing. *Alypia langtonii*.

Two white spots on hind wing. *Alypia langtonii* and *octomaculata*.

Spots on fore wing white.

One bar on hind wing, wings narrow. *Desmia maculalis*.

One spot on hind wing, wings broad. *Pyrausta funebris*.

Two rows of spots on fore wing.

Wings yellow below. *Papilio cresphontes*.

Wings orange-spotted below. *Papilio polyxenes*.

Many spots, looks checkered, red edge. *Euphydryas phaeton*.

Black and green.

Soft velvety blue-green. *Papilio troilus*. Male.

Brilliant peacock green. *Papilio philenor*.

Black and tawny. See "tawny" section.

PREDOMINANTLY YELLOW

Four-inch swallowtail or angle-wing.

Striped.

Yellow pale and tails very long and straight. *Papilio ajax*.

Bright yellow, tails shorter. *Papilio turnus*.

Border bright	{	Black and yellow swallowtail. <i>Papilio polyxenes calverleyi</i> .
		Brown and yellow angle wing. <i>Euvanessa antiopa hygiea</i> .

Not a swallowtail, moderate or small.

Hind wing black. *Heodes hypophlaeas fulliolus*.

Hind wing dull greenish or like fore wing.

Black border.

Border very irregular and a third width of wing.

Yellow below. *Zerene cæsonia*.

Pink below. *Z. c. var. rosa*.

Border a mere thread of black. *Callidryas eubule*. Female.

Border moderate.

Dull greenish below. Silvery eyespot in middle of hind wing.

Border of fore wing narrow and even. Males.

Border narrower. *Eurymus philodice anthyale*.

Border normal in width. *Eurymus philodice*.

Autumn form.

Border much wider on costa. Females.

Pale spots in border of hind wing below, border above strong on hind wing.

Hind wing greenish above. *Eurymus philodice*.

Late autumn.

Hind wing like fore wing above. *Eurymus philodice*.

Early fall.

Ground not pale-shaded below.

Border above weak on hind wing. *Eurymus philodice anthyale*.

Bright yellow below.

Silvery eyespot in middle of hind wing below.

Male with very narrow border, female without border on hind wing. *Eurymus interior*. Male, and female

form *laurentina*.

Male with broad border, female with good border on both wings. *Eurymus philodice*. Summer form.

No such silvery eyespot.

Smaller, border, covers about a third of wing. *Eurema euterpe*.

Larger, border concave and irregular on inner border.

Eurema nicippe flava.

Black spots on fore wing

Pale yellow. *Pontia rapæ novangliæ*.

Bright. Some GEOMETERS.

Red spotted. *Xanthotype crocataria*. Moth.

Wings unmarked above. *Callidryas eubule*. Male.

FIERY ORANGE. (BLACK BORDER.)

Border blue and as wide as orange part. *Lycomorpha pholus*.

Border black and narrower.

No silvery eyespot below. *Eurema nicippe*.

(A silvery eyespot below.)

Solid orange. *Eurymus eurytheme*.

Yellow with orange shade. *Eurymus philodice luteitincta*.

TAWNY, RED, OR BRIGHT BROWN, BLACK MARKS

Hind wing black, fore wing bright, black spotted.

With two rows of white spots. *Speyeria idalia*. Female.

With a row of white and one of orange spots. *S. idalia*. Male.

Pale at base, but without pale spots.

Expanse 2½ inches. *Polygonia interrogationis umbrosa*.

Expanse 2 inches. *Polygonia comma dryas*.

Small, hind wing with orange border.

Fore wing with one large spot, red. *Heodes hypophlæas*.
var. *fasciata*.

Fore wing with 8 spots, *bright red*. *H. hypophlæas*.

Fore wing *tawny*, with more spots. *Chrysophanus thoe*.
Female.

Fore wing with spots faint or wanting.

Bright red. *Heodes hypophlæas obliterata*.

Brilliant copper tinge, border also faint. *Chrysophanus thoe*. Male.

Fore wing tawny with fused spots. *Feniseca tarquinius*.

Hind wing not contrastingly different from fore wing.

Wings angled, fine lines below, wings alike.

White spot on each wing, checkered. *Eugonia j-album*.

Broad tawny median band. *Aglaïs milberti*.

Disc of wings tawny, with black veins. *Hypatus bachmanni*.

Checkered, no white.

Bright brown below.

Green scales on outer part below. *Polygonia faunus*.

Marks finer, and forming curved rays. *Polygonia comma harrisi*.

Silvery, a semicolon below. *P. interrogationis fabricii*.

Gray below.

Hind wing of two shades of gray. *Polygonia gracilis*.

Hind wing all alike. *Polygonia progne*.

Duller, silver comma angled. *P. p. I-argenteum*.

Brighter, comma rounded. *P. p. progne*.

Wings rounded, variously marked.

Small, wings triangular, stout bodied, with dark border and veins as a rule, swift fliers. *Skippers*.

Of various sizes, more slender, and marks different.

Fore wing dark, hind wing mostly orange. *Ancyloxipha numitor* (Skipper).

Wings about alike.

Rounded silvery or white spots below.

Small (1 inch expanse) ground pale buff below, even.

Pamphila palæmon (Skipper).

Over 1½ inches in expanse, ground below mottled.

Brenthis myrina.

Over 2½ inches in expanse.

Ground brick red, below.

No buff fringe on costa of hind wing. *Argynnis aphrodite*. Female.

A buff fringe on costa of hind wing. *A. atlantis* Male.

Ground deep rich brown. *Argynnis cybele*. Female.

Ground chocolate brown, mottled with yellowish silvery. *Argynnis atlantis*. Female.

Ground color paler brown.

Yellow band on hind wing below narrow. *A. aphrodite*. Male.

Yellow band ½ inch broad. *A. Cybele*. Male.

Silvery rays; small, checkered. *Brenthis montinus*.

No silvery.

Black with a red band and white spots. *Vanessa atalanta*.

About as much pale as black.

Black veins.

Black crossline on hind wing. *Basilarchia disippus*.

No such line.

Larger, some spots creamy. *Anosia plexippus*.

Smaller, all spots at tip white. *Basilarchia d. var.*

Black checkered.

Gray, eyespots, below.

Color Key to Butterflies.

Red, some white spots above.

Two large eyespots below. *Vanessa huntera*.

Several small eyespots below. *Vanessa cardui*.

Pale brown, no white. *Chlorippe clyton*.

Brown or white below.

Three inch, red brown. *Euptoieta claudia*.

One and a half inch, tawny.

Checkered below. *Cinclidia harrisii*.

Dark outer spot below.

Ground white, mottled. *P. tharos marcia*.

C. nycteis.

Ground cream, fine lines. *P. Tharos morphheus*.

Ground buff. *P. batesii*.

Mottled below, larger. *Brenthis bellona*.

Dark pale-ringed spots below. *Feniseca tarquinius*.

LIGHT GREEN

Very large, tailed. *Tropæa luna* (moth).

Not over 2 inches, not tailed. Several moths.

DULL COLORS

Deep brown, marked with black, or with eyespots only. See under BLACK.

Pale, whitish, brown checkered. *Pontia protodice*. Female.

Brown or gray, mottled, often with white points. *Thanaos*.

No white spots.

One and a half inches, smoother looking. *T. brizo*.

One and a quarter inches, transverse bands conspicuous.

Outer band very far in, of a row of rays. *T. ausonius*.

Bands normal. *T. icelus*.

Minute white points.

Contrasting black spots. *T. martialis*.

Less contrasting.

A paler brown patch at end of cell. *T. terentius*.

No distinct patch.

Very dark brown, black marked. *T. persius*.

Gray, mottled. *T. lucilius*.

Good sized white spots, $\frac{1}{2}$ inch across, say

Two translucent spots on apex of hind wing below. *T. juvenalis*.

No such spots, a pale patch beyond cell of fore wing. *T. horatius*.

Translucent, unmarked, moss-like below. *Eneis semidea*.

Otherwise marked. A good many day-moths.

OLIVE

Large peacock eyespots. *Junonia cænia*.

Small white points. *Lerema hianna*.

SKIPPERS

Long-tailed. *Eudamus proteus*.

Not tailed.

Silvery spot on hind wing below. *Epargyreus tityrus*.

Tawny spot on fore wing — typical.

No tawny spot above. Var. *obliteratus*.

No such spot.

Hind wing mottled below.

Black, unmarked, or tawny dots. *Poanes massasoit*. (f).

Tawny spot on fore wing. *Achalarus lycidas*.

Several large white spots. *Atrytone hobomok pocahontas*.

White points on fore wing.

Points as large as a pin prick. *Thorybes pylades*.

Points twice as large. *Thorybes bathyllus*.

Hind wing brown with pale border.

Fringe checkered. *Amblyscirtes vialis*.

Fringe not checkered, larger, and olive brown. *Lerema hianna*.

Fringe not checkered, larger, rich brown, ruddy at base below. *Lerema accius*.

Hind wing spotted or unmarked below, or with contrasts.

With a contrasting dark border.

Hind wing yellow.

Black above. *Poanes massasoit*.

Much tawny above.

Violaceous shade below. *Atrytone hobomok*.

Border very broad.

Border less than $\frac{1}{8}$ inch. *A. zabulon*. M.

Warm brown only. *Polites peckius*.

Hind wings dull grayish, tawny dots above often in f.
Poanes massasoit.

Spotted or unmarked.

Fringe checkered black and white. *Amblyscirtes samoset.*

Fringe not checkered.

Yellow below.

Brown dots.

Male with border above almost broken, female with tawny shades. *Hylephila phylæus.*

Male with somewhat wider border, female with white spots. *Thymelicus brettus.*

Brown bar at base. *Atrytone zabulon.*

Orange or tawny below. If very dull and not mottled, see under brownish.

Fore wing mostly fuscous. *Ancyloxipha numitor.*

Suffused with tawny, *male*; costa narrow tawny, *female.*

Fore wing mostly tawny.

Hind wing large-spotted below. *Erynnis sassa-cus.*

Hind wing unmarked below. *Atrytone dela-ware.*

Red or red-brown below.

Brick-red, spots contrasting, white. *Anthomaster leonardus.*

Dull brick-red, spots less distinct.

Tawny above. *Limochores pontiac.*

Pale yellow only above. *Erynnis attalus.*

Paler brownish red, yellow spots.

Tawny above is, — a triangular subapical spot, a cell-bar, and broad shade from base toward apex. *Potanthus dara.*

More tawny, shades fused. *Thymelicus mystic.*

Dull green below, contrasting white spots. *Erynnis comma manitoba.*

Faint spots. *Atalopedes campestris.*

Brown below with contrasting white marks.

Marks marbled looking. *Erynnis metea.*

A few sharp-edged spots. *Lerodea fusca.*

Dull with faint marks or none.

Marked with tawny above, rather broadly.

Tawny well spread, large spots below.

- Big square stigma. *Atalopedes campestris*.
 Faint stigma. *Phycanassa viator*.
 Minute spots or none. N. B. LIMOCHORES.
 Pale veins and rays, more tawny. *Limochores bimacula*. M.
 Faint spots, stigma straight. *L. manataaqua*. Male.
 Spots often wanting, stigma sinuous. *L. Cernes*. Male.
 Small tawny spots or white only. See Key *Black Skippers*.

BLACK SKIPPERS

- 1 Hind wing strongly lobed, large with much tawny hair. *Calpododes ethlius*.
 1 Smaller, hind wing not distinctly lobed. 2.
 2 Brown-black above and below, with small white dots on fore wing, wings short and round. *Pholisora catullus*.
 2 Not so dark, wings usually lanceolate. 3.
 3 Two distant black stigmas on fore wing. *Thymelicus otho*. Male.
 3 Stigma near continuous or lacking. 4.
 4 Some spots tawny, large with large faint spots below. 5.
 4 Spots below small or lacking. 6.
 5 Pale spot at end of cell of fore wing above. *Phycanassa vitellius*. Female.
 5 No such spot. *Hylephila campestris*. Female.
 5 Three tawny or white spots only. *Thymelicus otho*. Female.
 6 Deep purple-brown below. 7.
 6 Dull or tawny or greenish brown. 8. *Limochores*. Female.
 7 White markings conspicuous above. *Euphyes verna*.
 7 White markings faint or lost above. *Euphyes metacomet*.
 8 Separate as males do on preceding page.

A PRELIMINARY
KEY
TO THE CATERPILLARS
OF NORTH AMERICA
EAST OF THE MISSISSIPPI RIVER

BY WM. T. M. FORBES

EXPLANATION OF PLATE

1. Diagrammatic view of caterpillar.
i-viii. The tubercles and setæ.
T1, 2, 3, A1 to 10 the segments, numbering thorax and abdomen separately.
1 to 13. The segments, numbered consecutively.
T1 Prothorax.
T2 Mesothorax.
T3 Metathorax.
A7 Weak segment.
A8 Strong segment.
ant. Antenna.
clyp. Clypeus.
H. Head.
os. Osmeteria.
cerv. Cervical shield.
sp. Spiracle.
psp. Prespiracular wart of prothorax.
sv. w. Subventral wart of prothorax.
tl. Thoracic or true legs.
ms. sh. Mesothoracic shield.
mt. sh. Metathoracic shield.
sv. f. Subventral fold.
ann. Annulets.
inc. Incisure.
vl. Ventral legs.
l. pl. Leg-plates.
alp. Anal leg plate.
al. Anal leg.
ap. Anal plate.
pap. Preanal plate.
cd. h. Caudal horn.
2. Horn.
3. Branching spine of *Vanessid.*
4. Wart of *Saturnian.*
5. Caudal horn of *Sphecodina*, etc.
6. Caudal horn of *Pholus*.
7. Caudal horn of *Pholus vitis*.
8. Hair-tuft of *Haploa*.
9. Hair-tuft of normal *Bear*.
10. Tip of hair from pencil of *Hemerocampa*.
11. Branching spine of *Melitæid.*
12. Head of caterpillar, showing setæ
ant. Antenna.
md. Mandible.
lbr. Labrum.
acl. Anteclypeus.
cl. Clypeus.
i-ix. Epicranial setæ.
13. Stemapoda of *Harpyia*.
14. Caudal horn of typical *Sphinx*.
15. Caudal horn of *Daremma catalpæ*.
16. Caudal horn of *Marumba modesta*.
17. Showing wart arrangement typical of higher *Tineoidea*.
18. One segment of caterpillar, shown as if unrolled, — one half left out.
dors. r. Dorsal region.
lat. r. Lateral region.
sv. r. Subventral region.
mdv. r. Medioventral region.
mdm. Indicates middle of back, also dorsal line.
d. obl. Dorsal oblique.
add. l. Addorsal line.
add. obl. Subdorsal oblique.
sdl. Subdorsal line.
lat. obl. Lateral oblique.
lat. l. Lateral line.
sl. Stigmatal line.
subst. l. Substigmatal line.
svl. Subventral line.
mv. Middle of under side.
mdv. Medioventral line.
v-viii. Tubercles.

PREFACE

I MUST start with an apology for this paper. It is largely a compilation from descriptions of various ages and qualities. It is intended to show somewhere near what is known about our native caterpillars, and if possible to start entomologists hunting for additions and corrections to it. The SPHINXES, except the genus *Sphinx* and its close relatives, will probably be found in good shape; I think that the higher butterflies, the *Saturniina* and most of the families of the old groups *Sphingidæ* and *Bombycidæ*, will also work well.

The NOCTUIDS are in poorer condition, but probably there will be more omissions than corrections there since the specimens in the U. S. National Museum show their characters well. But the *Catocalæ* are much worse and must stay so till the publication of Beutenmüller's paper on those larvæ.

The *Geometridæ* will be least satisfactory. There are a great many forms, poorly described in a large part, and with no check on the amount of their variation, which is evidently large. For instance *Cosymbia lumenaria* has been bred by Dr. Dyar, and carefully worked out from a mottled caterpillar, while the old descriptions describe its caterpillar as green white-powdered, and striped, and I have verified that form.

I hope to publish a revision of this key soon, and would like to hear from any who have additions or corrections to it. Besides the many caterpillars that are completely unknown there are a number that could not be placed because of the pooriness of their descriptions, and more that will be found to be incorrectly placed. In two or three cases descriptions were absolutely contradictory, and I had to enter them twice, even on structural points.

Dyar's List of the Lepidoptera ¹ has been followed for the scientific names, except for two or three misprints and for four cases where two caterpillars were described under synonymous names, and therefore had to be separated for the present in the key. I have put in common names when I found them, but made no attempt to get a complete list. They came from everywhere, even

¹ Bulletin 52 of the U. S. National Museum.

from Abbot and Smith's *Lepidoptera of Georgia*, and are put in regardless of synonymy.

I am personally indebted to Prof. C. F. Hodge of Clark University for starting me on this work, and numerous ideas in the matter of arrangement and so forth. Dr. H. G. Dyar of the National Museum gave me much personal help, and also opened the U. S. National Museum collection to me, which is probably the best in existence, and without which these tables must have been much poorer, especially in the NOCTUIDS.

In the literature Mr. Wm. Beutenmüller's papers on *Catocala*¹ and his Monograph of the *Sesiidæ*² were very useful. From the latter the table of *Sesiidæ* (*Ægeriidæ*) comes almost as it stands. He also gave me personal help in *Catocala*. Prof. C. H. Fernald's Monograph of the *Sphingidæ*³ was indispensable in that family. Packard's Reports on the Forest Insects⁴ added species and foodplants in all parts of the tables. Beutenmüller's "Bombycidæ within Fifty Miles of New York City," served well for the kinds it covered. The *Rhopalocera* are mostly from Scudder's "Butterflies of New England." Of minor papers the most useful were Bird's work on *Papaipema*,⁵ a number of Dyar's papers, mostly on *Noctuidæ*, Dyar's Life Histories of *Geometridæ*,⁶ and many others.

Holland's Moth Book and Butterfly Book furnished the majority of the common names, though they also came from everywhere. Some, mere translations of scientific names, were omitted.

For a more complete bibliography see Henry Edwards' Catalogue of the Described Early Stages, U. S. National Museum Bulletin 35.

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¹ Especially Wm. Beutenmüller. Descriptions of Some Larvæ of the Genus *Catocala*. Bulletin American Museum of Natural History, XVI, 381-394, 1902.

² Memoirs of the American Museum of Natural History, Vol. I, part 6, 217-352.

³ C. H. Fernald, The *Sphingidæ* of New England, Orono, Me., 1886.

⁴ Henry Bird. New Histories in *Hydroecia* (*Papaipema*) Can. Ent. XXXII. XXXV. Various papers.

⁵ Now running in *Psyche*.

⁶ Bulletin No. 7 of the U. S. Entomological Commission and Fifth Report of the U. S. Entomological Commission.

INTRODUCTION

THESE tables are intended to include all the known caterpillars of the United States and Canada east of the Mississippi River and its continuation, except the smaller *TINEOIDEA*. All the *Tineoidea* that have been included in the *Sphinges* and *Bombyces* in the past are given, the rest omitted.

The Glossary will be sufficiently clear on most of the structural points. I have added several titles which have not been used in the key, or much in any caterpillar work, but which will doubtless give good characters when studied, *e.g.*, the mouth-parts and other anatomy of the head.

There are three main systems of numbering the segments of the body. One way, and the one mostly used here, is to refer to the head separately, and then to number the body-segments in order from 1 to 13. In this system 1 to 3 make up the thorax, and 4 to 13 the abdomen. Another way is to count the head as the first segment, though it is homologous to at least six, and can be easily distinguished from the body-segments; then the thorax will be joints 2 to 4, and the abdomen 5 to 14. This system is much used, and can generally be located in case of doubt, by the fact that special armature at the rear will generally occur on the 12th joint of this numbering, but on the 11th of the first system. Another way that avoids all ambiguity is to number the thorax and abdomen separately. Where this is done in the following key the thorax is marked by the letter T and the abdomen by A.

Many reckon the last two segments as one, thus making one less segment in all, and changing the number of the last one; the hairs are somewhat fewer in number on these segments but they can always be easily separated in a living specimen.

The arrangement of the hairs or setæ has not been used until lately for classification, but Dr. Dyar has shown how clear characters it gives, so I give here a synopsis of the system. Even in apparently naked forms the setæ, or the tubercles from which they have disappeared, can usually be made out with a magnifying glass.

The ABDOMEN has typically seven pairs of setæ and a pair of clusters: *i* is located on the subdorsum of the segment and toward

the front; ii is almost directly behind it; iii is a little ways above the spiracle; iv is below the spiracle behind, and v corresponds in front, but these last two often migrate, one or the other to a level with or even above the spiracle; vi is below these in the middle, vii is a cluster on the outside of the leg in front, and viii is near the middle line between the legs. On the legless segments vii and viii occur in the corresponding positions.

The MESO- and METATHORAX have a dorsal row of four, numbered ia, ib, iia, iib; iii, iv, and v form a triangle where the spiracle would be expected, with iv in front: vii and viii are as on the abdomen.

On the PROTHORAX there is a row of six around the edge of the cervical shield, of which the two lower sometimes separate to form distinct warts. There is a wart just before the spiracle, bearing normally three hairs (the prespiracular); and one below and behind it, which usually has two (the subventral).

The EPICRANIUM has nine hairs; i in front near the top; ii just below (in front of) i; iii opposite ii on the side of the head; iv above and in front of the eyes; v and vi far back about opposite the eyes, v being the upper; vii inside the concavity of the row of eyes, or near by; viii in front of the eyes, and ix above the antennæ.

On the CLYPEUS there are three pair of hairs, and on the ANTE-CLYPEUS two pair; besides several about the MOUTH PARTS.

The ventral feet are on joints 6, 7, 8, 9, and disappear first in front. By the other system on joints 7 to 10.

COLLECTING

Good directions are given in most of the popular books for collecting, breeding, and preserving caterpillars, and need not be repeated here. The most satisfactory way is to breed from the egg, for then one knows what one has even if the specimens all die in hibernation, and parasites are also avoided. It is safest to preserve the mother-moth, as often doubts come up as to identification, which can only be thus settled. Also specimens should be carefully labeled to be sure how the specimens correspond. Caterpillars are best preserved by inflation; often a straw or a hollow stem does as good work as the complicated blowpipes.

Foodplants have been given as far as possible for every kind, — where they are general feeders a few favorite plants are given, or some such note made as "*herbs*," etc. TREES without special note indicates *deciduous* trees only.

Some caterpillars are more or less strictly confined to plants of a given natural group, while others go more for plants of a certain type of growth. Still others seem to have no rhyme or reason in their choices, as the White-lined Sphinxes (page 70) preference for evening primrose in the green, and for low weeds like purslane in the black form. Here are a few groups of plants which most often go together: —

Apple, wild cherry and other Rosaceæ.

Maple, oak; *oak*, walnut, chestnut.

Maple, birch, sweet-fern.

Willow, *poplar*.

Sassafras, tulip tree, wild cherry.

All the exogenous trees, except conifers.

Hemlock, juniper.

In several cases of two closely related kinds one will be an unusually general feeder, while the other will specialize on the Pine tribe.

Milkweed, spreading dogbane.

Violet, pansy, passion flower.

The common cabbage worm (page 114) curiously chooses the mustard family and *tropæolum* (garden nasturtium)!

Grasses and sedges.

If the food of a caterpillar is unknown try it on what related kinds eat, or on some such list as the following, — wild cherry, oak, grape, pine, plantain, grass, dead leaves, wild mustard. If these do not succeed, there are all the various herb-families to select from; and if this fails the case is nearly hopeless, as the tree and shrub kinds mostly violate the botanical classifications.

If the food cannot be obtained try related plants, *and also* any plants of the same type of growth and qualities.

The *Arctiidae* (Bears) if not properly fed will eat naked caterpillars they may find; sometimes they will anyway, and must be put by themselves. Could they live on animal food alone?

I have gathered the two middle groups of *Apatela*, on page 117, and most of the *Datanæ*, on page 125, as there was danger that they could not all be classified under either the *hairy* or *naked* groupings.

NATURAL SYSTEM OF THE CATERPILLARS

I. Sub-primaries present are vi if any. *FRENATÆ*.

A. Tubercles iv and v approximate or joined except in a few minute forms, which are mostly leaf-miners, and all concealed feeders, no tubercles fused in middle line. *TINEOIDEA*.

1. Tubercles i and ii remote. (Normal *Cossid* series.)

(i) Large sack-bearers.

(ii) Sack with two outlets. *Lacosomidæ*.

(ii) Sack fusiform, with one outlet. *Psychidæ*.

(i) Minute sack-bearers, or of other habits.

(ii) Large wood-borers, with dorsal shields. *Cossidæ*.

(ii) Mostly quite small or minute. *Tineidæ*, etc., *Tortricidæ*, *Pyralidæ*.

2. Tubercles i and ii approximate or fused. (*Eucleid* series.)

(i) Cylindrical, hairy.

(ii) Sixteen feet. *Pterophoridæ*.

(ii) Fourteen feet. *Nolidæ*.

(i) Body flattened and slug-like.

(ii) Legs normal and 16. *Pyromorphidæ*.

(ii) Legs mostly normal and 20. *Megalopygidæ*.

(ii) Legs rudimentary [18.] *Eucleidæ*.

(ii) Characters uncertain. *Thyrididæ*?

B. Tubercles iv and v fused, tubercles i of joint 11 or 12 fused in middle line, with warts, large. *SATURNOIDEA*.

1. A single tubercle on joint A9.

(i) Heavily branched spines, stinging; no tubercle on anal plate. *Hemileucidæ*.

(i) Long, rough or short-branched horns, two tubercles on anal plate. *Citheroniidæ*.

(ii) Secondary hair. *Basilona*.

(ii) No secondary hair.

(iii) Many long horns.

(iv) Long spines on prothorax. *Citheronia*.

(iv) Low tubercles on prothorax. *Adelocephala*.

Syssphinx.

(iii) Two long horns. *Anisota*.

2. Paired tubercles on joint A9. *Saturniidae*.
 Branching, stinging spines. *Automeris*.
 (i) Tufts of hair, in adult. *Telea*, *Tropaea*.
 (i) Rounded warts in adult.
 (ii) Four warts at front larger. *Callosamia*.
 (ii) Six warts at front large. *Samia*.
 (ii) All warts alike, conical. *Philosamia*.
- C. Tubercles iv and v remote, iv higher than v. *BOMBYCOIDEA*. (The sub-grouping is necessarily artificial here.)
 1. Feet of A5 much smaller than of A6. *Geometridæ*.
 2. Feet of A5 and A6 equal.
 - (i) Tubercles simple, 1-haired.
 (ii) Feet normal.
 (iii) Tubercle iii doubled. *Thyatiridæ*.
 (iii) Tubercle iii normal. *Noctuidæ*. *Agaristidæ*, a few. *Notodontidæ* (part).
 - (ii) Last pair of feet modified.
 - (ii) Last feet entirely wanting. *Drepanidæ*.
 (iii) Last feet present not used. *Notodontidæ* (part).
 - (ii) Middle feet reduced. *Noctuidæ* (part).
 - (i) Tubercles converted into warts.
 (ii) One wart represents i and iia of thorax. *Syntomidæ*.
 (ii) Two warts represent i and iia of thorax.
 (iii) Most of abdominal tubercles 1-haired. *Lithosiidæ*.
 (iii) Most of tubercles changed to warts. *Arctiidæ*, and some *Noctuidæ*.
 - (ii) Three warts represent i and ii of thorax; little red tubercles dorsally on abdomen. *Liparidæ*.
 (iii) Long paired pencils on front and rear. *Parorgyia*.
 (iii) Long paired pencils at front and a single one at rear. *Hemerocampa*.
 (iii) Paired pencils at front and middle and an unpaired one at rear. *Notolophus*.
 (ii) No long pencils.
 (iv) Dense dorsal tufts. *Gynæphora*.
 (iv) Feathery dorsal tufts. *Euproctis*.
 (iv) Tufts all alike. *Ocneria*. *Psilura*.
- (i) Secondary hair.
 (ii) Hair dense, often pencils. Some *Noctuidæ*.

- (i) Hair light, mostly on sides, some modifications of body. *Lasiocampidæ*.
 - (ii) Hair light, body normal. *Notodontidæ*.
 - (iii) Dorsal pencils. *Apátelodinæ*.
 - (iii) Very little hair, no dorsal pencils. *Datana*.
- D. Tubercles v and iv distant, v higher and all lost after first stage, tubercles i of joint A8 unite into the caudal horn. *SPHINGOIDEA, Sphingidæ*.
1. Head very high, and conical, no horn at all. *Ellema*.
 2. Head normal; a horn or hard point or wart.
 - (i) Body granulated in adult, slanting stripes.
 - (ii) One long horn. *Smerinthinæ*.
 - (iii) Horn rudimentary. *Marumba*.
 - (iii) Horn long.
 - (iv) *Paonias, Cressonia, Smerinthus*.
 - (ii) One long horn, and four short. *Ceratomia*.
 - (i) Body smooth in adult, marks various.
 - (ii) A series of subdorsal eyespots, or yellow spots, horn long. *Chærocampinæ*.
 - (ii) Front end much swollen. *Theretra*.
 - (ii) Unusually cylindrical. *Deilephila*.
 - (ii) No such eyespots, horn varies.
 - (ii) Horn well developed, (checkered or) with slanting lines. *Acherontiinæ*.
 - (iv) Little black rings. *Phlegethontius*.
 - (iv) Few or no such marks. *Dolba*, "*Ceratomia*," *Sphinx*.
 - (ii) Variously marked; checkered forms (and those with slanting lines) have rudimentary horn.
- (iv) Rather cylindrical. *Sesiinæ*.
 - (v) Transverse stripes. *Pseudosphinx*.
 - (v) Longitudinal stripes. *Pachylia, Hemaris*.
 - (v) Slanting stripes. *Triptogon*.
 - (iv) Tapering to a very small head. *Philampelinæ*.
 - (v) Dorsal spot on top of thorax. *Dilophonota* (*Sesiinæ*).
 - (v) No such spot.
 - (vi) Rounded tubercle.
 - (vii) Tubercle white. *Argæus*.
 - (vii) Tubercle dark.
 - (viii) Slanting spots on sides only. *Pholus*.

Key to the Caterpillars.

- (viii) Checkered, or with more spots.
Sphecodina, *Lepisesia*.
- (vi) Small hard point. *Pholus*.
- (vi) Horn.
 - (vii) Slanting stripes and line. *Ampelophaga*.
 - (vii) Slanting stripes. *Amphion*.
 - (vii) Spots. *Lepisesia*.
 - (vii) Unmarked. *Deidamia*.
- E. Tubercles iv and v distant, v not above iv, none fused in middle line, all lost after stage 1 and replaced by secondary spines or pile. *PAPILIONOIDEA*.
 - 1. These are well classified in Scudder's "Butterflies of New England," which need not be copied here.
- F. Tubercles iv and v distant, permanent, and on a level, naked feeders. *Epiplemidæ* (Bombycoidea).
- II. Subprimary vi absent, two subprimaries toward rear of segments. *JUGATÆ*, *MICROPTERYGOIDEA*.
 - A. Minute, with 22 legs or all lost. *Micropterygidæ*.
 - A. Large, with 16 legs. *Hepialidæ*.

GLOSSARY

ABDOMEN, the last segments of the body after the first three and head; differs in caterpillar in arrangement of setæ.

ABDOMINAL FEET, the feet on the abdomen, soft and fleshy.

ADDORSAL, just below the middle of the back.

ADDORSAL LINE, a line in this region or any part of it.

ADDORSAL REGION, the region between a broad dorsal band and the subdorsal line.

ADULT, usually means the full-grown caterpillar; also equal to imago.

ANAL FEET or LEGS, the legs on the last segment.

ANAL LEG PLATE, a hard plate on the outside of the anal legs.

ANAL PLATE, the hard triangular plate covering the top of the anus.

ANNULET, a ring into several of which the segments are divided by shallow grooves.

ANTENNA, a conical bristle-like horn on the side of the mouth. The appendage of the second segment of the head.

ANTECLYPEUS, a small narrow plate between the clypeus and the mouth, it has two pair of setæ typically.

BEAR, an evenly hairy caterpillar, especially a tufted one of the *Arctiidae*.

BORER, under this heading are included all that live in the stems and roots of plants, even if in the pith cavity.

BUTTERFLY, the winged stage of a day-flying Lepidopter; especially one of the Rhopalocera which have clubbed antennæ and wings not connected.

CARDO, the basal joint of the maxilla.

CATERPILLAR, the larva of any of the Lepidoptera, may be distinguished from all other larvæ with more than six legs by the characters in the table.

CATERPILLAR, FALSE, see false caterpillar.

CAUDAL HORN, an unpaired tubercle wart or horn on the dorsum of joint 11. It is formed by the fusion of tubercles i.

CERVICAL SHIELD, a hardened plate of chitin, on the back of the first joint of the body. It bears a row of about six setæ around its edge.

CHECKERED, marked with rather regular spots in two contrasting colors. The marks are very rarely rectangular.

CHECKERINGS, such marks.

CHITIN, the horny matter of which the skin, etc., of an insect is composed. Normally brown when thick.

CHRYsalis, the pupa of a Lepidopter, especially of a butterfly.

CLAVOLA, the third (and succeeding if present) joints of the antenna. In caterpillars bristle-like.

CLYPEUS, the triangular plate on the front of the head, above the mouth. It bears three pair of setæ.

COCOON, the silk case protecting many caterpillars when they change to the chrysalis.

DORSAL, on the upper part of the body, especially near the middle of the back.

DORSAL LINE, the line in the middle of the back.

DORSAL OBLIQUES, oblique lines in the dorsal region, meeting in the middle line.

DORSAL REGION, the space between the two subdorsal lines, or the dorsum.

DORSAL PLATES or SHIELDS, hardened thick chitinous plates usually paired on the back. They occur especially in concealed feeders, and the most important are the cervical, mesothoracic, metathoracic, preanal, and anal.

DORSAL VESSEL, the heart.

DORSUM, the upper half of the body, above the subventral folds, or the dorsal region.

ECDYSIS, a moult.

EPICRANIAL SETA, a seta on the epicrania, there are regularly nine.

EPICRANIUM (pl. *epicrania*) one of the cases which cover the greater part of the top and sides of the head, in caterpillars not separated from the *genæ* and *occiput*.

EYES, are situated low down on the sides of the head in a curved row, minute and usually black, about six. See *ocelli*.

EYESPOTS, spots of one color surrounded by a contrasting roundish ring of another.

FALSE CATERPILLAR, larva, not a caterpillar with fleshy legs on the abdomen, they all have more than 16 legs, the normal caterpillar number, and the legs never have claws. They belong to the *Hymenoptera* (saw flies) and *Panorpata*.

FLAGELLUM, the clavola.

GALEA, the middle fork of the maxilla, unimportant in the caterpillars, but forms the tongue of the imago.

GENA, the side of the head between the mouth and eyes, a separate plate in other insects.

HAIR is used in a general sense, or distinguished from setæ as being soft and long.

HEAD, the head is always apparently one, the first segment, but is really composed of at least six, fused. It is often small and concealed when resting.

HEART, is a cylindrical vessel in the middle of the back. It shows as a dark line in many kinds, and gets confused with the dorsal line.

HORNS are long hard spines, without long branches.

HYMENOPTERA, contain the bees, etc., and also part of the false caterpillars. They are near relatives of the caterpillars.

HYPOPHARYNX, an appendage from inside the labrum. Perhaps the *spinneret* is the hypopharynx.

IMAGO, the actual adult stage of an insect, — in the *Lepidoptera* a butterfly or moth.

INCHWORM, a caterpillar that has only four legs useful at the rear and consequently doubles up its body at each step.

INCISURE, the fold of skin between two segments. It is usually slightly different in texture and color, but this is not counted as transverse banding unless very striking.

LABIUM, the jaw bounding the rear of the mouth. It seems to be formed by the fusion of two paired parts.

LABRUM, the hinged flap bounding the mouth in front.

LACINIA, the inner fork of the maxilla. Forms the chewing part.

LARVA, the young feeding stage of an insect; especially when absolutely wingless and followed by a resting pupa.

LAST SEGMENT, the partially fused 12th and 13th segments are often referred to together as the last segment.

LATERAL, on the sides of the body, between the subdorsal line and the subventral fold.

LATERAL LINE, a line situated about half way between the stigmatal and subdorsal lines.

LATERAL OBLIQUES, oblique lines extending across the lateral region, and often up onto the back.

LATERAL REGION, the space between the subdorsal and stigmatal lines.

LEAF-MINER, a caterpillar or other insect feeding between the two membranes of a single leaf.

LEAF-ROLLER, LEAF-FOLDER, a caterpillar living alone in a nest formed by folding or rolling a leaf and binding with silk, especially one of the *Tortricidæ*.

LEG PLATE, a more or less triangular hardened plate on the outside of an abdominal leg.

LEPIDOPTERA, the order which contains the caterpillars.

LIGULA, the middle piece of the labium, bearing the spinneret.

LINGUA, the ligula.

LOOPER, an inchworm.

MACRO, a moth of one of the higher groups, above the *Tineoidea*.

MANDIBLE, the principal biting and chewing mouth-part, in front of the smaller *maxillæ*.

MAXILLA, the smaller paired mouth-part behind the mandible. It has two basal joints, and then forks into the palpus, galea, and lacinia. Also called first *maxillæ*.

SECOND MAXILLÆ, the labium.

MAXILLARY, pertaining to the *maxilla*.

MAXILLARY PALPUS, the outer segment into which the maxilla fork.

MEDIOVENTRAL LINE, the line in the middle of the under side.

MEDIOVENTRAL REGION, the space between the legs beneath, and the corresponding part of the legless segments.

MESOTHORACIC, pertaining to the mesothorax.

MESOTHORACIC SHIELD, the dorsal shield on the second joint, most often paired.

MESOTHORAX, the second joint of the thorax and of the body.

METATHORACIC, pertaining to the metathorax.

METATHORACIC SHIELD, dorsal shield, usually paired on the third joint.

METATHORAX, the third joint of the thorax and of the body.

MICRO, a small moth of the *Tineoidea*.

MOTH, a *lepidopter* that is dull in color and flies by night; strictly,

all that have no club to the feelers, or have the wings fastened together at the base.

MOTTLED, with markings irregular and not of strikingly contrasting colors, or too fine for the marking to be noticed with the naked eye.

MOTTLINGS, such marks.

MOULT, the shedding of the skin periodically. There are usually some four or five moults, with noticeable change in the size of the head at each.

MOULTING COCOON, a structure similar to a cocoon in appearance, but used for moults before the final change to pupa.

NEST, any permanent structure built by a caterpillar to live in.

OCELLUS (pl. *Ocelli*), a simple eye, one without facets, the only kind that occurs in a caterpillar.

OCCIPUT, the back of the head, not a distinct plate in the caterpillars.

PALPUS, MAXILLARY. See maxillary palpus.

PALPUS, LABIAL, or simply PALPUS (in describing imagoes of Lepidoptera) the outer lobe or appendage of the labium.

PANORPATA, a suborder of net-winged insects, having caterpillar-like larvæ; the Scorpion-flies.

PEDICEL, the second joint of the antenna.

PRÆ. See pre.

PREANAL PLATE, a dorsal plate on the 12th segment, usually paired.

PREMANDIBLE, the appendage of the third segment of the head, always rudimentary, and lacking in caterpillars.

PRESPIRACULAR WART, a wart on the first segment just in front of the spiracle, usually two-haired.

PRIMARY SETÆ, the setæ that probably existed in the ancestral caterpillar, viz., ia, ib, iia, iib, iv, vii, viii of the thorax and i to v, vii, and viii of abdomen.

PRIMARIES, the primary setæ.

PROLEGS, used by different authors either for the thoracic or abdominal legs, and so not used here.

PROPLEGS, the abdominal legs.

PROTHORAX, the first segment of the thorax and of the body.

PROTO, a member of the larger Tineoidea that were formerly included in the Spinners. The larger Tineoidea.

PUPA, the resting stage in an insect that has one when the imaginal structures are forming. The stage between larva and imago, when the wings are small and useless.

SACK-BEARER, a caterpillar that carries a sort of clothes around with it.

SCAPE, the basal joint of the antenna.

SECOND MAXILLA, the labium, or half of it.

SECONDARY HAIR, hair indefinite in position and more or less dense-set.

SECONDARY TUBERCLES, the tubercles from which such hair springs.

SEGMENT, a part of the body that serves as a unit, moving together and separated from its neighbors by folds of skin.

SEMILOOPER, a caterpillar that has some legs reduced (usually) so that it loops up the fore part of the body when walking, while the hind body walks normally.

SEMIPUPA, the caterpillar when the pupa is already formed within its skin and is about to shed it and become a pupa.

SETA, a hair in general; especially a rudimentary or stiff one.

SHIELDS, the same as *dorsal shields*; also flat shields are formed by the enlargement of the tubercles, mostly in borers.

SLUG CATERPILLARS, short, small-headed, flattened oval caterpillars, of the families Eucleidæ, Lycænidæ, Pyromorphidæ, Thyrididæ (the last not given in tables since too little known).

SPINE, a long stiff outgrowth of the body, often heavily branched.

SPINNERET, the conical organ on the tip of the labium through which the silk flows.

SPINULE, a branch of a branching spine.

SPIRACLE, a breathing pore. They occur on the sides of the first thoracic and most of the abdominal segments, the one on joint 11 being largest and last.

STEMAPOD, an anal foot which has lost its terminal hooks, and become long, spinulated, and tapering. It is not used for walking, and usually has an eversible lash at the end.

STIGMA, a spiracle.

STIGMATAL LINE, a line usually pale or dark over pale, passing near the spiracles.

STIPES, the second joint of the maxilla, bearing the lacinia, galea, and palpus.

STRIPES, the most important and constant stripes are the *dorsal*,

the *subdorsal*, the *stigmatal*, and the *medioventral*. All but the last of these are typically white, or edged on both sides with a fine dark line (as in many cutworms). The *addorsal*, *lateral*, and *subventral* lines are usually fainter, and often do not have this character. The *substigmatal* is usually broadly dark over pale and may migrate up and become the *suprastigmatal* when there is no *subventral* fold.

STRONG SEGMENT, the 11th, as it is almost always more strongly armed than the others. This is a handy test of an author's numbering of segments, as a reference to any special armature in the rear almost always points to this segment, whether it is numbered 11 or 12 (or 8 of the abdomen).

SUBDORSAL LINE, the line about half way between the dorsal and the spiracles. It runs near tubercles ii.

SUBDORSAL OBLIQUES, the outer of two sets of oblique lines when there are two in the dorsal space as in the *Cutworms*.

SUBDORSAL REGION, the upper part of a caterpillar's side, or the outer part of its back, centered by the *subdorsal* line.

SUBPRIMARIES, **SUBPRIMARY TUBERCLES**, certain definite tubercles that appear in some groups but do not appear to be primitive. They are iii and v of thorax, vi, iiiia, and iva of abdomen in the *Frenatæ* and two tubercles at the rear of the segments on the abdomen of the *Jugatæ*.

SUBPRIMARY SETÆ, those borne on the *subprimary* tubercles.

SUBSTIGMATAL LINE, a line on the *subventral* fold or in its place below the spiracles, usually dark above and pale below.

SUBVENTRAL FOLD, an irregular longitudinal fold of skin not far below the spiracles, usually marked by a change of ground-color.

SUBVENTRAL LINE, a line between the *substigmatal* and the legs.

SUBVENTRAL REGION, the space between the *subventral* fold and legs.

SUBVENTRAL WART, of the prothorax, — a wart, typically three-haired, below and behind the spiracle.

SUPERSTIGMATAL LINE, a line close above the spiracles.

SUPRA-ANAL PLATE, the dorsal plate of the 13th segment, usually triangular and unpaired.

TENT, a silk nest made by a group of social caterpillars.

THORACIC, pertaining to the thorax.

THORACIC FEET, the first six feet, which are horny and jointed.

THORAX, the first three joints of the body, differing in arrangement of setæ from the rest.

TRUE LEGS, the thoracic legs, which become the legs of the imago.

TUBERCLES, small hard projections of the skin bearing each a hair.

TUSSOCK, a hairy caterpillar with odd tufts.

VASCULAR LINE, the dorsal line.

VENTER, the under side, all between the subventral folds.

VENTRAL FEET, the feet on the front segments of the abdomen.

VERTEX, the top of the head, or the part opposite the mouth if held horizontally.

WART, a hump of the skin, bearing a cluster of tubercles, each with its hair.

WEAK SEGMENT, the 10th segment. It is never specially armed, and in armed forms is less armed than the rest.

WORM, properly a (legless) animal of the group Vermes; in composition applied to an animal resembling a worm, as a caterpillar.

The segments are numbered with Arabic numbers, either commencing with the prothorax, or numbering the thorax and abdomen separately.

The stages of the larva are in Roman capitals I, II, etc.

The tubercles and setæ are in small Roman numerals i, ii, etc.

- | | |
|-----------------|--|
| A. abdomen. | F. family, or natural group of plants. |
| B. butterfly. | M. moth. |
| C. caterpillar. | T. thorax. |

COMMON NAME

SCIENTIFIC NAME

Food plant.

KEY TO THE CATERPILLARS.

- 1 Leaf miners.¹
- 1 Sack-bearers. 2.
- 1 Of other habits, mostly naked feeders. 3.
- 2 Case covered with leaves and with two openings of equal size.
- LACOSOMIDÆ. 490.
- 2 Case variously covered, fusiform and over half an inch long.
- PSYCHIDÆ. 491.
- 2 Case much smaller or often entirely of silk. MICROPS.²
- 3 Twenty-two legs. 4.
- 3 Twenty legs. 5.
- 3 Sixteen legs, often unequally developed. 6.
- 3 Fourteen legs are useful, the last pair being modified or lost. 7.
- 3 Fourteen legs, there being none on joint A3. 302.
- 3 Twelve legs only, none on A3 or 4. 9.
- 3 Ten legs only, none on A3, 4, or 5. *Inchworms*. 191.
- 3 No prolegs at all, body very short, and creeping by ventral suckers. SLUG-CATERPILLARS. EUCLEIDÆ. 173.
- 4 Ventral feet, on joints A1 to 8, no anal feet.³

ERIOCEPHALA

Mosses.

- 4 Feet on A2 to 8 and on last joint also. *Sawflies*.⁴
- 5 Short, slug-shaped, with considerable long woolly hair.
- FLANNEL-MOTHS. MEGALOPYGIDÆ. 170.
- 5 Various, often slimy. *Sawflies*.⁴
- 6 Body variously humped, or spined (the regular tubercles or a soft hump or joint A8 not counted). 10.
- 6 Body hairy in tufts from warts. 111.
- 6 Body with noticeable secondary hair. 101.
- 6 *Body* unmodified, except as noted. 11.

¹ Omitted from tables. ² Omitted from tables. ³ Perhaps none occur in America of this type. ⁴ Not caterpillars, but Hymenoptera.

7 Hind feet wanting entirely, usually an unpaired spine on anal plate. *Hook-tips*. 82.

7 Hind feet modified into a long pair of tails, several times as long as head. *Horn-tails*. 98.

7 Hind feet moderate in size. 8.

8 Hind feet used when walking, two long horns on second joint. *BASILARCHIA*. See 51.

8 Many small spines and a red hump on A1.

RED-HUMPED C. SCHIZURA CONCINNA *Apple*, etc.

8 Various humped. 85.

8 At most a low hump on joint A8. 335.

9 First pair of ventral feet much smaller than the others. *GEOMETERS*. 190.

9 Abdominal feet all equal. *NOCTUIDS*. 309.

10 Joint A8 has a horn, and rest unarmed. *SPHINXES*. 19.

10 Joint A8 has an eye like tubercle, and rest unarmed. *SPHINXES*. 16.

10 Joint A8 has a little hard angle, and rest unarmed. *SPHINXES*. 15.

10 Various soft humps. 85.

10 Long soft tails. 47.

10 Several hard spines, or enlarged tubercles. 48.

10 Soft hairy lappets low on the sides, and sometimes other small tubercles. *LAPPET C.* 163.

11 Two little horns sticking back from last joint, head often with long spines. *SATYRS*, etc. 269.

11 No such horns, head angled or rounded. 12.

12 First joint of body much smaller than either head or next joint. *SKIPPERS*. 278.

12 First joint of body moderate or enlarged. 13.

13 Oval, flattened, slug-like, head small. *LYCÆNIDÆ*. 324.

13 Body not much flattened. 14.

14 Head very high, triangular; body striped or rectangularly checked; large.

CHECKERED PINE SPHIX	LAPARA BOMBYCOIDES	<i>Pine</i>
HARRIS'S PINE SPHIX	LAPARA HARRISII	<i>Pine</i>
SOUTHERN PINE SPHIX	LAPARA CONIFERARUM	<i>Pine</i>

14 Head not much higher than wide. 304.

SPHINXES, HAWK-MOTHS.

15 Checkered in black and white; with some red.

PAINTED SPHIX	PHOLUS VITIS	<i>Jussiaea</i>
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15 A black spot on top of joint three.

DILOPHONOTA ELLO	<i>Psidium</i>
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16 Variously checkered. 17.

16 Slanting white spots on sides. PHOLUS. 18.

16 Red with yellow subdorsal, and slanting lines.

LEPISESIA JUANITA

16 Brown, white mottled, and wart white.

GAUDY SPHIX	ARGEUS LABRUSCÆ	<i>Cissus</i>
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17 Wart surrounded with a black ring.

YELLOW-BANDED DAY-SPHIX	LEPISESIA FLAVOFASCIATA
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17 Wart surrounded by a brown ring; or wart bright orange, (next to last stage).

CHECKERED GRAPE-VINE SPHIX	THYREUS ABBOTII	<i>Grape F.</i>
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18 White spots are some three times as long as wide.

PHOLUS ACHEMON	<i>Grape F.</i>
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18 Spots are some once and a half as long as wide.

PHOLUS PANDORUS	<i>Grape F.</i>
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19 Slanting lines on sides, aiming up towards rear. 28.

19 No slanting lines. 24.

20 Checkered. 42.

20 Unmarked or with faint marks. 25.

20 A subdorsal row of eyespots. 26.

20 A black spot dorsally on joint T3.

DILOPHONOTA ALOPE	<i>Jatropha Carica</i>
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20 Light transverse stripes on incisures, black.

GIANT GRAY SPHIX	PSEUDOSPHIX TETRIO	{ <i>Jessamine</i> <i>Plumeria</i>
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20 Longitudinal stripes. 21.

21 A dark dorsal stripe. 23.

21 There is only the heart showing through dorsally. 22.

22 Very large.

FIG SPHINX

PACHYLIA FICUS

Fig

22 Small.

AMPHION NESSUS. Young. *See* 28.

LEPISIESIA FLAVOFASCIATA. Young. *See* 17.

23 Dark, white-edged dorsal stripe.

HUMMING-BIRD CLEAR-WING

COMMON CLEAR-WING HEMARIS THYSBE *Viburnum*, *Apple F.*

23 Dull brownish dorsal stripe.

BUMBLEBEE M.

HEMARIS DIFFINIS

Honeysuckle

24 Body and spine polished and shining, no slanting stripes.

A. "PROMINENT"

PHEOSIA DIMIDIATA

Poplar

24 Spine rough and granular. 20.

25 Bright orange, small, with swollen base of horn.

THYREUS ABBOTII. Young. *See* 17.

25 Green.

LETTERED SPHINX

DEIDAMIA INSCRIPTUM

Grape

26 Third joint much enlarged, and with a larger eyespot.

CHÆROCAMPATERSA

Madder F.

26 Eyespots about equal; cylindrical. 27.

27 Subdorsal horizontal, and lateral slanting red eyespots.

LEPISIESIA GAURÆ

Gaura

27 A subdorsal row of oval black-bordered eyespots.

DARK-VEINED DEILEPHILA

DEILEPHILA GALLII

{ *Willow-*
herb, &c.

WHITE-LINED SPHINX

DEILEPHILA LINEATA

Various

28 Nine dark slanting lines, horn small.

AMPHION NESSUS

Grape F.

28 Nine white slanting lines, and a pink, white-edged dorsal.

CYPRESS SPHINX

HYLOICUS CUPRESSI

Cypress

28 Usually seven lines. 29.

28 Eight lines and a subdorsal band. *Deidamia inscripta.*

See 25.

¹ The young of several kinds come here also, but in most the head is rounded.

47 Two longer tails at each end.
MILKWEED C., MONARCH B. ANOSIA PLEXIPPUS *Milkweed F.*

47 Three pair of filaments on joints 2, 5, and 11.
THE QUEEN ANOSIA BERENICE *Milkweed F.*

47 Several rows of various-sized filaments.
GREEN SWALLOWTAIL LAËRTIAS PHILENOR { *Dutchman's*
Pipe

48 Various small black, shining, enlarged tubercles. 48½.
48 A subdorsal row of enlarged tubercles, black and yellow, and two to a joint.

PSEUDAGLOSSA LUBRICALIS *Grass*

48 Tubercles generally bright colored, and never more than one to a joint in each row, often horns. 49.
48 A fringe of little rootlike processes near base of legs. *Catocala*. 463.

48½ Black dorsal tubercles on joints 4 and 11. *Melalopha*. 91.
48½ Irregular rows of black horny tubercles on most of the joints.

SOUTHERN WHITE PONTIA MONUSTE *Mustard F.*

48½ A pair of high tubercles on thorax.

DAINTY SULPHUR NATHALIS IOLE *Fetid Marigold (Dysodea)*

48½ Black enlarged tubercles on second and third joints, and often many others in a lateral and a subdorsal row.

DOG-FACE B. ZERENE CÆSONIA *Amorpha*, etc.

49 Considerable secondary hair, and horns very short, yellow
IMPERIAL MOTH BASILONA IMPERIALIS *Trees, Pine*

49 No noticeable secondary hair. 50.

50 Several very small silvery white horns, rudimentary; caterpillar sphinx-like.

SYSSPHINX BISECTA *Honey-locust*

50 Two spines on second joint much longer than all the rest
51.

50 Five spines, four at front, and the caudal horn much more developed. 53.

50 Many conspicuous spines. 55.

51 Spines rough, a pale saddle in middle.

BLUE EMPEROR BASILARCHIA ASTYANAX *Wild Cherry*

WHITE ADMIRAL BASILARCHIA ARTHEMIS *Birch, etc.*

VICEROY; FALSE MILKWEED B. B. DISIPPUS *Poplar F.*

BASILARCHIA FLORIDENSIS *Poplar F.*

51 Spines smooth and polished. ANISOTA. 52.

52 Head red, body faintly striped longitudinally.

SPOTTED FOREST-MOTH ANISOTA STIGMA *Oak*

52 Head yellow, body longitudinally pink striped.

PINK-STRIPED OAKWORM ANISOTA VIRGINIENSIS *Oak*

52 Similar, stigmatal stripe very strong, and upper ones washed out.

ANISOTA CONSULARIS (Fla.) *Oak*

52 Head black, body black and yellow striped.

YELLOW-STRIPED OAKWORM ANISOTA SENATORIA *Oak*

52 Head and body green, paler striped.

ROSY FOREST M. ANISOTA RUBICUNDA *Maple*

53 Horns green, caudal horn much the largest.

FOUR-HORNED SPHINX CERATOMIA AMYNTOR *Elm*

53 Front horns red and rear one yellow, equal. 54.

54 A yellow lateral ridge.

CALLOSAMIA ANGULIFERA *Tulip tree, etc.*

54 No yellow lateral line.

SMALL EMPEROR M. CALLOSAMIA PROMETHEA *Trees, especially tulip tree*

- 55 No spines in middle of back. *Fritillary Butterflies.* 76
55 A series of spines in middle of back. *Butterflies.* 63.
55 Dorsal spines on joints 11 or 12 or both. *Emperor Moths.*
56.
55 A subdorsal row of slender horns; black.
APATELA FUNERALIS *Hickory, Birch, Elm, Apple*
55 A subdorsal row of slender, spatulate horns; green or brown
APATELA AFFLICTA *Oak*
Emperor Moths
56 Spines heavily branched, like tufted hair. 61.
56 Tubercles with a single whorl of long bristles (young larvæ)
62.
56 Spines are long recurved horns. 57.
56 Short tubercles, about equal in size. 60.
57 Joint 1 well spined. 58.
57 Joint one with low tubercles only. 59.
58 Caudal horn about equal to front horns; black spots on top
of several incisures near front.
ROYAL PINE M. CITHERONIA SEPULCRALIS *Pine*
58 Caudal horn hardly two thirds length of front horns; a broad
black spot in one incisure, divided lengthwise.
HICKORY-HORNED DEVIL, ROYAL WALNUT M. CITHE-
RONIA REGALIS *Walnut, etc.*
59 Dorsal spines conical, irregular in length.
HONEY LOCUST M. ADELOCEPHALA BICOLOR { *Honey-*
Locust
60 Tubercles all bluish white.
AILANTUS SILK-WORM, OLIVE EMPEROR M.
PHILOSAMIA CYNTHIA *Ailantus, etc.*
60 First four tubercles dull red, body dull green.
CECROPIA EMPEROR M. SAMIA CECROPIA *Trees*
60 First six tubercles concolorous, red, body grass green.
COLUMBIA EMPEROR M. SAMIA COLUMBIA *Larch*
61 Spines in dorsal rows much shorter.
BUCK M. HEMILEUCA MAIA *Oak*
61 Spines in dorsal rows longest.
CORN EMPEROR M. HYPERCHIRIA IO *Various*

- 62 Head and body vertically black banded. *Callosamia*. See 54.
 62 Head only, black banded. *Luna moth*. See 152
 62 Green. 152.
 62 Black, red, or yellow *cecropia*, first three stages. See 60.

Butterflies.

- 63 Spines with central axis and terminal spinule. *Anglewings*. 64.

- 63 Spines without terminal spinule, like conical warts. 73.
Checkerspots

- 64 Dorsal spines begin with joint 4. 65

- 64 Dorsal spines begin with joint 5.

- SMALL TORTOISESHELL B. AGLAIS MILBERTI *Nettle*

- 64 Dorsal spines begin with joint 6.

- MOURNING CLOAK, YELLOW EDGE
 EUVANESSA ANTIOPA *Elm, Willow*

- 65 Head spined. 66.

- 65 Head not spined. VANESSA. 71.

- 66 Spinules of body spines whorled. POLYGONIA. 68.

- 66 Spinules very irregular. 67.

- 67 One dorsal spine on joint 11.

- COMPTON TORTOISE EUGONIA J-ALBUM *Willow*

- 67 Two dorsal spines on joint 11.

- BUCKEYE JUNONIA CÆNIA *Herbs*

- 68 Back of abdomen broadly pale.

- GREEN COMMA POLYGONIA FAUNUS *Willow*

- 68 Back like rest of body. 69.

- 69 Spinules come from below middle on head-spines.

- SEMICOLON POLYGONIA INTERROGATIONIS *Elm F.*

- 69 Spinules come from middle of head-spines. 70.

- 70 Head spines stout with long spinules.

- BROWN COMMA POLYGONIA COMMA *Elm F.*

- 70 Head spines slender with shorter spinules.

- GRAY COMMA POLYGONIA PROGNE *Elm, Currant*

71 White segmental spots in front of second row of spines.

PAINTED BEAUTY VANESSA HUNTERA *Everlasting*

71 No such spots. 72.

72 Spinules of apical whorl equal to length of spines from base of spine up to whorl.

PAINTED LADY, THISTLE B. VANESSA CARDUI *Thistle*

72 Spinules of apical whorl shorter.

RED ADMIRAL VANESSA ATALANTA *Nettle*

73 Striped crosswise. 74.

73 Striped lengthwise. 75.

74 Considerable secondary hair; four spines on third joint and one wart on first.

THE BALTIMORE EUPHEDRYAS PHAETON *Turtlehead*

74 Inconspicuous secondary hair; three spines on third joint, and several warts on first, on each side.

HARRIS' CHECKERSPOT CINCLIDIA HARRISII (an *Aster*) *Diplopappus*

75 Tubercles stout, twice as high as wide, white at base.

PEARL CRESCENT PHYCIODES THAROS *Asters*

75 Tubercles slender, three times as high as wide.

SILVER CRESCENT CHARIDRYAS NYCTEIS *Aster*

75 Dorsal tubercles black, laterals white.

CHLOSYPNE JANAIS

76 Head spined. 77.

76 Head at most, angled. 78.

77 Dark-spotted.

ZEBRA B. HELICONIUS CHARITONIUS } *Passion Flower*

77 Striped.

AGRAULIS VANILLÆ *Passion Flower*

78 Spines about half as long as segments, wart-like. *Brenthis*. 79.

78 Spines about as long as segments. 80.

79 Two long spines on first joint.

LITTLE SILVERSPOT BRENTHEIS MYRINA *Violet*

79 All spines about equal.

MARSH FRITILLARY BRENTIS BELLONA *Violet*

80 Upper spines of first joint long and clubbed, larva striped.
VARIEGATED FRITILLARY EUPTOIETA CLAUDIA *Violet, etc.*

80 Upper spines of first joint long: black, base of some spines bright.

SEMNOPSYCHE DIANA *Violet*

80 Upper spines of middle of body longer: mottled.

DARK FRITILLARY SPEYERIA IDALIA *Violet*

80 Spines all about equal, body blackish. 81.

81 Black, spines orange at base.

GIANT FRITILLARY ARGYNNIS CYBELE *Violet*

81 Deep purple, spines whitish at base.

MOUNTAIN SILVERSPOT ARGYNNIS ATLANTIS *Violet*

81 Like cybele but slenderer and duller.

APHRODITE ARGYNNIS APHRODITE *Violet*

HOOK-TIPS

82 A minute wart on supra-anal plate, no enlarged tubercles.

EUDEILINEA HERMINIATA *Cornel*

82 Certain subdorsal tubercles enlarged, a cylindrical projection on anal plate. 83.

83 Process long, more than twice length of head, a large dorsal hump on joint three.

ORETA ROSEA *Viburnum*

83 Process about equal to diameter of head, no unpaired hump.
84.

84 Warts on joints 2, 3, and 11 enlarged.

FALCARIA BILINEATA *Birch*

84 Warts on joints 2 and 3 no larger than on 5, on 11 minute.

FALCATE HOOK-TIP DREPANA ARCUATA *Birch F.*

PROMINENTS

85 Middle legs very long, and cast heads usually carried in a string.

HARRIS'S THREE-SPOT HARRISIMEMNA TRI-SIGNATA *Winterberry, Lilac*

86 Three crescentic yellow ridges and a pair of small tubercles.
THE BROTHER RAPHIA FRATER *Poplar*

87 Transverse naked ridges on joints 4 and 11, bark-like.

87 Slender, muscular, semiloopers in gait, with a hump, or tubercle on joint 8; marks bark-like. *Catocala*, etc. 463.

88 Humps on joints 5, 6, and 11 only.

OAK FORKED-TAIL FENTONIA MARTHESIA *Oak*

HEREROCAMPA UMBRATA *Oak*

ELM LEAF CATERPILLAR NERICE BIDENTATA *Elm*

91 Wart on joint 4 small, simple; a similar one on 11.

91 Warts on joint 4 two, small and approximate or partly fused. 92.

POPLAR MOCHA-STONE MELALOPHA INCLUSA *Poplar*

SCHIZURA BADIA *Viburnum*

HYPARPAX AURORA *Oak*

SCHIZURA SEMIRUFESCENS *Forest trees*

- 94 No hump on joint 3. 95.
- 95 Two tubercles on joint 8. 96.
95 Joint 8 unarmed. 97.
- 96 Front of body translucent green.
SCHIZURA IPOMŒÆ *Trees*
- 96 Body all darkish brown.
SCHIZURA LEPTINOIDES *Trees, Hickory*
- 97 A white V-mark on back toward rear.
- UNICORN PROMINENT SCHIZURA UNICORNIS } *Trees and Shrubs*
- 97 No such mark.
IANASSA LIGNICOLOR *Oak, etc.*
- Horn-tails**
- 98 One dorsal wart on joint 3.
CERURA SCITISCRIPTA *Poplar F., Cherry*
- 98 Two dorsal tubercles on joint 3.
CERURA OCCIDENTALIS *Cherry*
- 98 No dorsal tubercles. 99.
- 99 Joint 3 entirely green.
GRAY PUSS HARPYIA CINEREA *Willow*
- 99 Dark dorsal band continuous, though very irregular. 100.
- 100 Ochre spots subdorsally in the brown saddle.
HARPYIA SCOLOPENDRINA *Willow*
- 100 No such spots.
HARPYIA BOREALIS *Cherry*

SECONDARY HAIR

- 101 Short yellow spines also.
IMPERIAL M. BASILONA IMPERIALIS *Trees, Pine*
- 101 Low humps, or caterpillar unmodified. 102.
- 102 Solid black, striped or rectangularly spotted, hair light, hind feet not used when resting. DATANA. 416.
- 102 Otherwise, hind feet always used. 103.

103 Hair dense and concealing body, or with pencils. 104.

103 Hair light and mostly on sides. 110.

104 Hair rather thin, small short pencils dorsally on most of the segments. APATELODES. 105.

104 Otherwise. APATELA. 106.

105 An odd tuft at front and no long pencils.

APATELODES ANGELICA

105 Single long pencils on joints 2, 3, and 11.

APATELODES TORREFACTA *Maple*

106 No hair pencils present longer than the general hair. 109.

106 Pencils on joints 4, 6, and 11 only. 107.

106 Pencils on other joints. 108.

107 Divergent paired pencils on joints 4 and 6.

AMERICAN MAPLE MOTH APATELA AMERICANA *Maple, etc.*

107 All pencils unpaired.

FINGERED DAGGER APATELA DACTYLINA { *Alder, Willow,*
Birch

108 No pencils on joint 6.

COTTONWOOD DAGGER APATELA POPULI *Poplar*

108 A good-sized pencil on joint 6.

HACKBERRY DAGGER APATELA RUBRICOMA *Hackberry*

109 Hair stiff and black, pencils present, but not longer than the rest.

AMERICAN ALDER DAGGER APATELA HASTULIFERA *Alder*

109 Hair soft and bending over to one side.

MILLER M. APATELA LEPORINA *Poplar F., Birch*

110 Ground color gray-blue, white dorsal spots.

FOREST TENT C. CLISIOCAMPA DISSTRIA *Forest trees*

110 Ground color bright blue, white dorsal line.

COMMON TENT C. CLISIOCAMPA AMERICANA *Apple, etc.*

110 Otherwise. APATELA. 358.

TUFTED HAIR

111 Flattened, with hairy lappets on sides. LAPPET C. 163.

111 Oval, slug-like, hair in little dense tufts; warts of upper row (i and ii) fused on each segment. *Pyromorphidæ*. 167.

111 Large, green, warts ii of joint 11 fused in middle line. 152.

111 Small, slender, warts iv and v approximated or fused.
Featherwings ¹

111 With dense hair or pencil-like tufts, or with warts i and ii
 and iv and v distant, i sometimes single-haired. 112.

112 With hair all the same character, or with scattered longer
 hairs. *Bears*. 120.

112 With some long pencils. *Tussocks*. 153.

112 Hair of two kinds, — stiff, and short and feathery. 113.

113 Dense tufts on back even with the rest, beginning on joint
 4. 114.

113 Dense tufts on sides of joints 4 and 10 even with the rest.
 SCARLET-BODIED WASP M. COSMOSOMA AUGÉ (Fla.) *Mika-*
nia scandens.

113 Some hair notably longer than the rest. 115.

114 *Arctic* and on *Mt. Washington, N. H.* Dense tufts, brown
 and yellow.

GYNÆPHORA ROSSII

Cottonwood

114 *Florida*.

LESSER WASP M.

PSEUDOMYA MINIMA

} *Myginda*
 } *ilicifolia*

115 Dense dorsal tufts, and usually pencils. Mostly *Tus-*
socks. 163.

115 Fine feathery hair at the base of several dorsal tufts. 116.

116 Two retractile red tubercles on top of joints 9 and 10.

BROWN-TAIL M.

EUPROCTIS CHRYSORRHEA

Elm

116 No such tubercles. 117.

117 Substigmatal is a row of yellow spots.

SMARTWEED C., SMEARED DAGGER APATELA OB-
 LINITA

Shrubs, etc.

117 Substigmatal faint or diffuse, not yellow. 118.

118 A double row of white subdorsal spots on warts i and ii.

APATELA XYLINIFORMIS

Birch

118 Warts i and ii not contrasting. 119.

¹ Not included in key.

119 Black with red stigmatal.

BURGLAR DAGGER APATELA NOCTIVAGA { *Poplar and Low
Plants*

119 Reddish, tawny, and black.

APATELA SPERATA *Poplar and Alder*

Bears, etc.¹

120 A sharp wart on top of joint 11 and often on others.

APATELA. 358.

120 Body not modified. 121.

121 Body green, lightly hair-tufted. APATELA. 358.

121 Body not green. 122.

122 Dorsal line irregular, or irregularly broken. APATELA 358.

122 Dorsal line even, punctiform, or inconspicuous. 123.

123 Body all mahogany red, shining; scanty black hair.

COMPOSIA FIDELISSIMA (Fla.) *Echites*

123 Body not solid red. 124.

124 All the tufts long, equal, and pencil-like.

POLKA-DOT WASP M. SYNTOMEIDA EPILAIS (Fla.) *Nerrium
odorum*

124 Tufts spreading. 125.

125 Hair sheared off even, black at ends and tawny in middle.

BLACK-TIPPED BEAR, ISABELLA TIGER M.

ISIA ISABELLA *Herbs*

125 Hair close-sheared, tawny, black toward head.

RUBY TIGER M. PHRAGMATOBIA FULIGINOSA *Herbs*

125 Hair usually not sharply of two colors, graded in size. 126.

126 Hair quite thin, little red tubercles on dorsum of joints 9 and 10. 127.

126 Hair often dense, no such little red tubercles. 128.

127 Tubercles of joints 1 to 5 blue, the rest red.

GIPSY M. OCNERIA DISPAR *Oak, etc.*

¹ The *Bears* (all the kinds under this heading here except *Apatela* and *Arsi-lonche*) are general feeders on low plants. The *Hyphantrias*, however, if not disturbed, are tent-builders on various trees; if knocked off their food they take up the usual Bear habits.

- 127 A dark cross-bar on second joint.
 BLACK ARCHES M. PSILURA MONACHA Oak, etc.
- 128 Body and hair pinkish brown, a dark dorsal line.
 CALIDOTA STRIGOSA (Fla.)
- 128 Red transverse stripes. 129.
- 128 Dark, more or less pale-striped longitudinally. 130.
- 128 A row of pale dorsal spots, black. 128a.
- 128 Black, unmarked. 140.
- 128 Pale, striped. 141.
- 128 Black, warts pale.
- ARCTIC TIGER M. HYPHORAIA PARTHENOS Herbs
- 128 Not black or striped. 142.
- 128a Dorsal spots red. 128b.
- 128a Dorsal spots pale.
- PHYLLIRA M. APANTESIS PHYLLIRA Various
- APANTESIS RADIANS Various
- 128b Black body and hair, bright spots.
 APANTESIS PLACENTIA Various
- 128b Brown body, thin, soft hair, black-edged spots.
- FORKED DAGGER M. APATELA FURCIFERA Wild Cherry
- 129 Black, red transverse and yellow longitudinal marks. 132.
- 129 Black, red, bands between segments.
- GREAT LEOPARD M. ECPANTHERIA DEFLOREATA Herbs
- 129 Black, red and yellow transverse bands.
- ECHO M. SEIRARCTIA ECHO Sabal Palmetto
- 130 Body with little, short, dense tufts, a bright yellowish lateral stripe, interrupted with black crosslines, and usually other stripes. *Haploa*. 130½.
- 130 Otherwise. 131.
- 130½ Yellow dorsal and stigmatal. *H. fulvicosta*.
- 130½ Much red in dorsal line. *H. reversa*.
- 130½ Dorsal line weak or failing. *H. confinis*.
- 130½ A strong tendency to a subdorsal stripe, all lines pale yellow and concolorous. *H. confusa*.
- 131 Ground color yellow-spotted, and some red marks. 132.
- 131 Otherwise. 133.

132 Substigmatal broken, yellow, warts often black. *Smearred Dagger*. See 117.

132 Substigmatal rigid, yellow, warts always red.

POWDERED WAINSCOT WHITE-VEINED DAGGER ARSILON-
CHE ALBOVENOSA *Various*

133 Dorsal stripe only. 139.

133 No dorsal stripe. 136.

133 Dorsal and lateral or stigmatal stripes. 134.

134 Stripes greenish white.

LOBELIA DAGGER APATELA LOBELIÆ *Oak*

134 Stripes flesh colored.

PALE TIGER M. APANTESIS ARGE *Herbs*

• 134 Dorsal flesh color and stigmatal yellow.

VIRGIN TIGER M. APANTESIS VIRGO *Herbs*

134 Stripes yellow or orange. 135.

135 Three stripes on each side besides dorsal.

APATELA RADCLIFFEI *Wild Cherry*

136 A yellow subdorsal. 137.

136 No subdorsal, a vague stigmatal only. 138.

137 One large wart on thorax representing i and ii; lateral line often present, hair whitish.

CTENUCHA VIRGINICA *Grass*

138 Hair soft and pale, a few black ones at ends.

PRINTED DAGGER APATELA IMPRESSA *Shrubs, etc.*

138 Hair soft and pale at middle, stiffer and reddish at ends.

APATELA DISTANS *Shrubs, etc.*

138 Hair all stiff, and black-tipped or black.

APATELA XYLINIFORMIS *Birch*

139 Dorsal line pink and continuous, hair black.

APANTESIS NAIS *Herbs*

139 Dorsal line irregular, hair black.

F-MOTH APANTESIS FIGURATA *Herbs*

140 Hair on lower parts of sides red-brown.

STRIPED TIGER M. APANTESIS VIRGUNCULA *Herbs*

HARNESSED M. APANTESIS PHALERATA Herbs

140 Hair on lower parts of sides dull yellow.

GREAT TIGER M. ARCTIA CAJA Herbs and perhaps others

140 Hair all black or dull brown.

APANTESIS INTERMEDIA, A. ANNA A. PARTHENICE, A. VITTATA,
A. PHALERATA, A. VIRGO, A. VIRGUNCULA, etc. Herbs

141 Yellow, with dark substigmatal stripe and brown hair.

HAPLOA CLYMENE Oak

141 Striped in several colors.

SCEPSIS FULVICOLLIS Grass

142 Head and body orange, warts and hair gray.

AMMALO EGLENENSIS Milkweed

142 Head, body, and hair silver gray.

AMMALO TENERA Dogbane

142 Head or body mottled or sometimes not distinctly marked.

143.

142 Spotted brightly with black, orange, and white.

BEAUTIFUL UTETHEISA UTETHEISA BELLA Crotalaria, etc.

143 Hair pale or tawny, black-tipped. 144.

143 Hair all tawny. 146.

143 Hair pale yellow or whitish, very fluffy, body pale. 145.

143 Head dark, body pale, hair yellow and rather stiff.

FLORIDAN EUCEREON EUCEREON CONFINE (Fla.)

143 Hair fuscous or black on upper parts. 147.

143 Hair mostly whitish, rather scanty. 149.

143 Hair black and white in the same tufts. 148.

144 Hair coarse and sparse, pale or with some red; a broad reddish substigmatal line. *Apatela xyliniformis*. See 138.

144 Hair very soft and fluffy as in *Yellow Bear* (145), always tawny.

RED-LEGGED ERMINE M. DIACRISIA LATIPENNIS Herbs

145 Hair all sheared off even.

SNOWY EUPSEUDOSOMA EUPSEUDOSOMA INVOLUTUM (Fla.)

145 Hair of several lengths.

YELLOW BEAR, VIRGINIA ERMINE M. DIACRISIA
VIRGINICA

Various

146 Hair very soft, dense, and fluffy. *Yellow bear*. See 145.

146 Hair somewhat sparser and coarser, and a little duller in color, a variety of *Salt Marsh C*. See 147.¹

147 Hair tawny on lower parts, caterpillar about 2 inches long.
SALT MARSH C. ESTIGMENE ACRÆA *Various*

147 Hair white on lower parts. *Apetala lobeliæ*. See 134.

147 Hair all black, red spots on sides of body, or body all reddish.

WHITE-BODIED ESTIGMENE ESTIGMENE CONGRUA *Various*

147 Hair fuscous, often reddish on sides; body broadly fuscous on back.

MANY-SPOTTED ERMINE M.

HYPHANTRIA CUNEA *Forest Trees*

FALL WEBWORM, FIRE WORM HYPHANTRIA TEX-

TOR (WALNUT VARIETY) *Forest Trees*

147 Hair all alike, fuscous, body grayish, tubercles black.

EUBAPHE AURANTIACA *Weeds*

148 Upper warts black, lower ones orange. *Eubaphe aurantiaca*. See 147.

148 Warts greenish, except one row on sides.

APATELA BETULÆ *Birch*

149 A double row of yellow spots on sides.

UNMARKED DAGGER M. APATELA INNOTATA *Hickory?*

149 No such spots. 150.

150 Hair very scanty, body mottled, faint yellow spots on sides; small.

LYCOMORPHA PHOLUS *Lichens*

150 Otherwise, body white or gray. 151.

151 Head black with yellow spots.

THE LAUGHER CHARADRA DERIDENS *Oak, etc.*

151 Head otherwise.

SALT MARSH C. (young). See 147.

FIRE WORM (Apple variety). See 147. *Apple F.*

¹ These caterpillars look very much alike and there is no character to get hold of to separate them.

152 Slanting lines on sides, head red.

AMERICAN SILKWORM ~ TELEA POLYPHEMUS *Maple, etc.*

152 Lines are vertical and cross dorsum, head green.

EMPRESS. M., LUNA M. TROPÆA LUNA *Nut Trees*

Tussocks

153 Dense dorsal tufts on several joints, body visible through hair. 154.

153 No dense dorsal tufts, hair often dense; long pencils always present. 159.

154 Dorsal tufts on several joints and many pencils at ends.

MILKWEED TUSOCK EUCHÆTIAS EGLE *Milkweed*

154 Dorsal tufts on three joints only.

YELLOW-HAIRED DAGGER APATELA IMPLETA *Trees*

154 Paired pencils at front end and middle, four dense tufts.

BLACK HEADED TUSOCK, RUSTY VAPORER M.

NOTOLOPHUS ANTIQUA *Apple F. etc.*

154 Paired pencils on first joint only, an unpaired one at rear; four dorsal tufts. *Hemerocampa*. 155.

154 Paired pencils at both ends, and variable dorsal tufts. 157.

155 Head red. 156.

155 Head and body pale yellow.

WELL-MARKED TUSOCK M., YELLOW-HEADED TUSOCK

HEMEROCAMPA DEFINITA *Trees*

156 Body with a broad, yellow subdorsal band.

WHITE-MARKED TUSOCK M. RED-HEADED TUSOCK

HEMEROCAMPA LEUCOSTIGMA *Trees*

156 Sides of body solid slate gray.

HEMEROCAMPA INORNATA *Trees*

157 Tufts grading regularly to rear, a short-sheared tuft on joint 11.

DARK-CLOUDED TUSOCK M. OLENE ACHATINA *Oak*

157 A long pencil on joint 11 dorsally. 158.

158 Body dark, hair on sides all gray.

OLENE PLAGIATA *Oak*

158 Body whitish, hair dirty white.

BLACK AND WHITE TUSOCK M. OLENE LEUCOPHÆA

BROWN LAPPET M. EPICNAPTERA AMERICANA } *Wild*
 } *Cherry, etc.*

- 166 No such distinct wart, smaller.

HETEROPACHA RILEYANA

Pyromorphidæ

- 167 Dense small black tufts. HARRISINA. 168.

- 167 Hair inconspicuous. 169.

- 168 Yellow, regularly black-tufted.

GRAPE PROCRIS HARRISINA AMERICANA *Grape*

- 168 With black and white transverse bands.

HARRISINA TEXANA? . *Ampelopsis*

- 169 A broad dark lateral line.

ACOLOITHUS FALSARIUS *Grape F.*

- 169 Irregular pale squares, separated by dark lines.

PYROMORPHA DIMIDIATA *Dead Oak Leaves*

FLANNEL MOTHS

- 170 Hair scanty, body gaily spotted.

CARAMA CRETATA *Judas Tree*

- 170 Hair dense, concealing body. 171.

- 171 Hair pale; forming a tail at rear, and little curled tufts at the sides near rear.

MEGALOPYGE OPERCULARIS *Orange, Apple*

- 171 Hair soft, and without any distinctive tufts. 172.

- 172 Hair cream-white when young, tawny and black in adult.

CRINKLY FLANNEL M. LAGOA CRISPATA *Alder, etc.*

- 172 Hair gray-white when young, gray in adult.

YELLOW FLANNEL M. LAGOA PYXIDIFERA *Oak*

SLUG C.

- 173 Long lappets on several segments, and short ones on the rest.

HAG C., BAT C. PHOBETRON PITHECIUM { Apple, Oak,
Shrubs, etc.

- 173 Long subdorsal spines on two segments, and none at all on the middle segments.

SADDLE-BACK C. EMPRETIA STIMULEA *Trees and Shrubs*

- 173 A number of larger or smaller spines; on all segments. 174.

- 173 No spines. 182.

- 174 A large number of equal spines in a lateral row. 175.
174 Spines of lateral row inconspicuous, of subdorsal row very large. 181.
175 Caterpillar about three times as wide as thick.
SISYROSEA TEXTULA Oak, Forest trees
175 Nearly cylindrical, prismatic. 176.
176 Spines long and slender.
EUCLEA INDETERMINA Apple, Oak, etc.
176 Spines very short and low. 177.
177 Body very much humped about joint 5.
EUCLEA CHLORIS Hickory, Oak, Cherry, etc.
177 Body not notably humped. 178.
178 Green or with entire dorsum purplish. 179.
178 A purple dorsal irregular line. 180.
179 Somewhat flattened.
SPINY OAK SLUG EUCLEA DELPHINII } Oak, Myrica, etc.
Forest trees
179 Chunky, cylindrical; with yellow marks.
NASON'S SLUG NATADA NASONI Oak, Chestnut, Beech, etc.
180 Spines on last joint much longer than the rest.
ADONETA BICAUDATA
180 Spines on last joint no longer than the rest.
FOX-FACED M. ADONETA SPINULOIDES Cherry, Trees
and Shrubs
181 Very fluffy, white.
ISOCHÆTES BEUTENMULLERI
181 Not fuzzy looking, with red spots.
ALARODIA SLOSSONIÆ
182 A tail at rear. Packardia. 183.
182 No such tail. 184.
183 Blue-green. PACKARDIA GEMINATA. Wild Cherry, Trees
183 Yellow-green. PACKARDIA ELEGANS. Wild Cherry, Trees
184 Subdorsal ridge sharp and crested, especially at middle.
SKIFF C., BEECH NUT BOX
PROLIMACODES SCAPHA Trees, etc.
184 Subdorsal ridge low and rounded. 185.

- 185 Some red marks on back. 188.
185 Back all greenish. 186.
186 A yellow transverse line on joint 2.
COCHLIDION Y-INVERSA *Oak.*
186 No such line. 187.
187 Yellow-green.
LITHACODES FASCIOLA *Cherry, Trees, etc.*
187 Gray-white-green.
COCHLIDION BIGUTTATA *Oak*
188 Dorsal red marks only, yellow neck.
HETEROGENEA SHURTLEFFI *Oak, Chestnut, Beech*
188 Red spots run far down on sides. 189.
189 Red dorsal mark arrowhead shaped, or more filled out. at
rear.
TORTRICIDIA PALLIDA *Willow, Oak, etc.*
189 Red dorsal mark is usually a narrow cross.
TORTRICIDIA FLEXUOSA *Cherry, Trees*
189 Dorsal mark is a wide cross, or filled out into a diamond
shape.
TORTRICIDIA TESTACEA *Oak, Trees, etc.*

GEOMETRIDÆ, INCH-WORMS

- 190 A subspiracular fringe.
METROCAMPA PRÆGRANDARIA
- 190 Fringes on last four legs.
ALCIS SULPHRARIA
- 190 No subspiracular fringe.
- FALL CANKERWORM ALSOPHILA POMETARIA { *Apple,*
Elm
- 191 Dorsum regularly dark spotted, not humped. 192.
191 Otherwise. 193.
- 192 Horn color, spotted above, striped below.
NEPYTIA SEMICLUSARIA *Pine*
- 192 Orange, about ten spots on each joint.
TEPHROCLYSTIS ZYGADENIATA *Zygadenus*

200 Paler brown or green. 201.

201 Head high and deeply cleft, apices acute (head half higher than wide). 202.

201 Head moderate and apices rounded, body very slender.

CHLOROCHLAMYS CHLOROLEUCARIA

202 Body stout, segments a fourth longer than wide.

NEMORIA SUBCROCEATA

Oak

203 Rough with many warts.

JUNIPER TWIG INCH-WORM SYSSAURA INFENSATA *Juniper*

203 Few tubercles, not more than one complete row. 204.

204 Some transverse ridges on body. 205.

204 No transverse ridges. 210.

205 A transverse hump on *first* joint and tubercles at middle and rear.

CLEFT-HEADED SPAN-WORM LYCIA COGNATARIA { *Currant,*
Maple, etc.

205 One transverse ridge on joint 8 or 7. 207.

205 One transverse ridge near middle of body (4, 5, or 6). 209.

205 A strong transverse ridge on joint 2, ending in pairs of red tubercles; orange tubercles.

ABBOTANA CLEMATARIA

Trees

205 Strong approximate ridges on joints 2 and 3.

METANEMA QUERCIVORARIA

Oak

205 Strong tuberculate transverse ridges on joints 7 and 8.

EUTRAPELA ALCIPHEARIA

Maple

205 Ridges on joints 4 and 8.

EUCHLÆNA OBTUSARIA

Chestnut

205 Ridges on joints 6 and 9.

THERINA ENDROPIARIA

Oak, etc.

205 A large number of ridges. 206.

206 Mostly low transverse wrinkles, strongest on joints 5 and 8.

THE NOTCH-WING

ENNOMOS MAGNARIUS

Maple

206 High tuberculate ridges. 207.

CARIPETA ANGUSTIORATA

Pine

207 A ridge on joint 7, joint 2 swollen at sides, pale crescent in front of ridge; small tubercles at rear, with transverse stripes.

LARGE MAPLE SPAN-WORM SABULODES TRANS-
VERSATA *Trees*

207 Otherwise, ridge on joint 8? 208.

208 A silvery V-mark on joints 8 and 9; joint 2 much swollen at sides.

SABULODES ARCASARIA *Alder*

208 Tubercles on joints 2, 4, and 5; a black dorsal line behind ridge on joint 8.

SABULODES LORATA *Sweet Fern*

209 Ridge on joint 4, sharp tubercles on 8 and 11.

EUCHLÆNA PECTINARIA *Wild Cherry*

210 A pair of callosities on the sides of prothorax only.

DIVERSE-LINED M. EUSTROMA DIVERSILINEATA *Grape*

210 Some dorsal tubercles. 211.

211 A single pair of dorsal tubercles on middle of joint 8 only. 212.

211 Tubercles dorsal on joint 3 and ventral on 1.

OAK BEAUTY M. NACOPHORA QUERNARIA *Oak, etc.*

211 A pair of tubercles on joint 11 only. 213.

211 Paired tubercles on joints 7 and 8, those on 7 larger.

MECOCERAS NITOCRIS (Fla.) *Coccoloba*

211 Paired tubercles on joints 7 and 11. 214.

211 Paired dorsal tubercles on joints 1 and 9, and laterals on 5.

RACHEOSPILA SALTUSARIA (Fla.) *Condalia*

212 Grayish white, shading to red.

CABERODES CONFUSARIA *Clover*

212 White dorsal segmental spots, tubercle on 8.

HYPERITIS AMICARIA *Wild Cherry*

212 Dorsum white shaded, half of joint 4 blackish; tubercles small.

EUCHLÆNA ASTYLUSARIA *Trees*

213 Joint 3 not swollen. 266.

213 Joint 3 swollen.

PLAGODIS *sp*

214 Second joint much swollen. *Sabulodes transversata*. See 207.

214 Second joint normal. 215.

215 Head and tail large and red.

ENNOMOS SUBSIGNARIUS

Trees

216 A series of dorsal lozenges, triangles or chevrons. 217.

216 *Dorsum* without noticeable diagonal marks. 220.

217 A dorsal lozenge, and two chevrons toward rear.

EUCHLÆNA PECTINARIA

Oak

217 A series of dorsal lozenges. 218.

217 A series of pink dorsal triangles.

FLAME CARPET GYPSOCHROA DESIGNATA *Mustard F.*

217 A series of dark triangles or arrowheads. 219.

218 White lozenges crossed by a double black line; large.

STENOTRACHELYS APPROXIMARIA *Smilax, Oak*

218 Pale lozenges with dark spots in the middle.

RED TWIN-SPOT PETROPHORA FERRUGATA *Alsine, Glechoma*

218 Pale lozenges on a dark shade.

GEM PERCNOPTILOTA FLUVIATA *Smartweed*

219 Yellow lateral stripe.

219 Dorsal V-marks *light and dark*; striped on sides.

RHEUMAPTERA SOCIATA

Galium

CARIPETA DIVISATA

Hemlock

219 Slanting stripes on sides.

THE ABSINTH TEPHROCLYSTIS ABSYNTHIATA *Compositæ*

219 Sides paler, mottled.

MESOLEUCA INTERMEDIATA

Jewel-weed

219 Red anal plate. TEPHROCLYSTIS MISE-

RULATA

Low plants

219 Beautifully marbled in brown, pink, white, etc.

MESOLEUCA CÆSIATA

Bilberry

220 Slanting stripes on sides. 267.

220 No slanting stripes. 221.

220 A brown V-mark on dorsum near front.

CURRENT ANGERONA XANTHOTYPE CROCATARIA *Various*

- 221 Black, or black-brown, not mottled. 268.
221 Not very dark. 222.

- 222 Row of spots. 224.
222 At most one or two spots. 223.

- 223 Longitudinally striped or unmarked, may have spots. 230.
223 One transverse stripe on each joint, and no spots. 229.
223 Evenly mottled. 262.
223 Contrastingly spotted in yellow-green and dull red.

WELSH WAVE M. VENUSIA CAMBRICA *Mountain Ash*

- 223 Dorsum dark, contrasting, not striped. 260.

223 Rounded black spots on joints 6 and 7, and often pink incisures.

RED CARPET PETROPHORA MUNITATA *Senecio*

- 224 Dorsal spots. 225.
224 Subdorsal or lateral spots. 228.

- 225 Pale spots on a dark-brown ground. 226.
225 Red dorsal spots.

SYNELYS ENNUCLEATA *Wild Cherry*

- 225 Small black spots, running together; gray, head dark.

SHARP-ANGLED CARPET HYDRIOMENA UNAN-

GULATA *Chickweed*

- 225 Black rectangular spots; striped. 236.
225 Lilac and black eyespots, and other pink marks.

PINK-STRIPED WILLOW SPANWORM DEILINEA VARIO-

LARIA *Willow*

- 226 Patches various and ill defined. 227.
226 Patches clear and rectangular.

PSYCHOPHORA SABINII

- 227 Very large. *Stenotrachelys approximaria*. See 218.
227 Small, front part swollen and flattened, rough.

FIR-NEEDLE INCH-WORM TEPHROCLYSTIS LUTEATA *Fir*

- 228 Black and pink eyespots.

DEILINEA ERYTHREMARIA *Willow*

- 228 Yellow, with brown subdorsal spots.

DEPTALIA INSULARIA *Celastrus*

- 229 Yellow stripes on incisures.
 MARBLED CARPET MESOLEUCA TRUNCATA *Strawberry*
- 229 Dark bands on incisures, dull brown.
 EXELIS PYROLARIA *Pyrola*
- 229 Dark bands on middle of segments, blurred and strongest
 at middle of body.
 MELANCHROIA GEOMETROIDES (Fla.) *Cicca*
- 230 Unmarked. 231.
- 230 Broken punctiform stripes. 232.
- 230 Striped clearly. 235.
- 230 Fine hairlines and a large brown patch on joints 6 and 7,
 enclosing white spots.
 TETRACIS CROCALLATA *Sumach, Chestnut*
- 230 Green, with dorsal dark shades at ends. 233.
- 230 Dull red with faint traces of lines.
 CYMATOPHORA BRUNNEATA *Bilberry*
- 231 Dull red.
 CLEORA LARVARIA *Wild Cherry*
- 232 Lines of white and yellow spots.
 LESSER MAPLE SPAN-WORM PSYSOSTEGANIA
 PUSTULARIA *Maple*
- 232 Lines of dark spots, fine dorsal and strong lateral spots.
 LEPTOMERIS SIDERARIA
- 233 All green with traces of white lines. 234.
- 234 A little red shade on tail, and sometimes at head.
 MESOLEUCA VASALIATA
- 234 Dark dorsal band on joints 11 and 12, head green.
 HYDRIOMENA MAGNOLIATA *Willow Herb*
- 234 Dark dorsal band, interrupted in middle, head white.
 HYDRIOMENA MULTIFERATA *Willow Herb*
- 235 A row of dark dorsal rectangular spots. 236.
- 235 Clustered black spots on segments beneath.
 SHARP-ANGLED CARPET HYDRIOMENA UNANGU-
 LATA *Chickweed (Alsine)*

235 Black dorsal spots on 6, 7, and 8, green with faint white stripes and reddish substigmal shade.

PHRYGIONIS ARGENTEOSTRIATA (Fla.) *Ardisia*

235 A black and yellow eyespot on last joint, dull red dorsal.

ECTROPIS CREPUSCULARIA *Poplar, Alder, etc.*

235 No noticeable black spots. 237.

236 Dashes short and thick, some 4 times as long as wide.

CATOPYRRHA DISSIMILARIA *Clover*

236 Dashes long and narrow.

CATOPYRRHA COLORARIA *Clover*

237 Bright yellow with narrow darker stripes. 238.

237 Dorsum very dark, with fine yellow lines, venter pale yellow.

SCALLOP SHELL M. HYDRIA UNDULATA *Wild Cherry*

237 Not predominately yellow and dark. 239.

238 Spiracles dark and flanked with black crescents.

CHAIN-DOTTED GEOMETER CINGILIA CATENARIA *Sweet Fern,*
and many other plants.

238 Stripes uninterrupted, head reddish.

LIME-TREE WINTER M., LIME CANCERWORM

ERANNIS TILIARIA *Trees*

238 Dark dorsal, subdorsal and stigmal, yellow with greenish-brown stripes.

CURRENT FRUIT WORM TEPHROCLYSTIS INTERRUPTO-
FASCIATA *Clover, etc.*

239 A transverse stripe on third incisure, no subdorsal stripe.

NORTHERN SPINACH M. EUSTROMA POPULATA *Poplar*

239 No segment with distinctive marks. 240.

240 Red striped. 241.

240 Not red striped. 242.

241 A red lateral line.

MARbled CARPET MESOLEUCA TRUNCATA *Strawberry*

241 Stripes dull red on a gray ground, stout.

STOUT POPLAR SPAN-WORM LYCIA URSARIA *Poplar*

242 Ground color finely striate, dark on pale; with a pale or orange subdorsal.



THERINA PELLUCIDARIA	<i>Pine</i>
THERINA ATHASIARIA	<i>Oak</i>
THERINA FERVIDARIA	<i>Spruce</i>
THERINA FISCELLARIA	<i>Oak</i>

242 Otherwise, rarely finely striped. 243.

243 Some dark stripes. 244.

243 No dark stripes except perhaps a single narrow dorsal.
251.

243 Red-brown with black dorsal, close yellow addorsals, and yellow stigmatal and subdorsal.

CYMATOPHORA BRUNNEATA *Blueberry*

243 Broad dark, white-centered dorsal stripe, white lateral stripes.

SCIAGRAPHA HELIOTHIDATA *Locust*

244 Greenish dorsal and lateral stripes on a browner ground.

HYDRIOMENA AUTUMNALIS *Alder*

244 Ground color full as green as the lines. 245.

245 Stripes broad, dorsal and addorsal on an orange ground.

CARSIA PALUDATA *Cranberry*

245 Ground color not orange. 246.

246 Dorsal line black, white centered. 247.

246 Dorsum otherwise dark striped. 248.

246 Dorsum pale striped. 249.

246 Dorsum not distinctly striped. 250.

247 Mottled, a dark subdorsal in front.

EOIS INDUCTATA *Herbs*

247 Stigmatal line black over white.

LEPTOMERIS SIDERARIA (young). See 232.

248 About 8 dorsal dark lines, the upper six doubled.

EPELIS TRUNCATARIA *Bearberry*

248 All stripes blurred and broad, dorsum redder.

SAW-WING EUCHLÆNA SERRATA *Maple, etc.*

249 Stigmatal and three dorsals white, three laterals dark.

SPRING CANKERWORM PALEACRITA VERNATA *Apple*

249 Broad white addorsals edged below with dark, rest of bands white.

RED-HEADED INCH-WORM MACARIA BISIGNATA *Pine F.*

- 249 White addorsal, subdorsal, etc., triple dark lateral.
GRANITE MOTH SCIAGRAPHA GRANITATA *Spruce*
- 250 Yellow stigmatal, and brown hairlines below.
NEPYTIA SEMICLUSARIA *Pine*
- 251 Green, body sprinkled with white. 252.
251 Body not densely white sprinkled. 253.
- 252 All stripes white, dorsal strong.
COSYMBIA LUMENARIA *Sweet Fern*
- 253 Not green, dorsal and lateral stripes doubled.
HYDRIOMENA SORDIDATA. See 268.
- 253 Stripes not in pairs. 254.
- 254 Under side with a number of white stripes.
CHEVRON M. EUSTROMA TESTATA *Poplar F., Birch*
- 254 A single broad subventral band, broad lateral and approximate addorsals.
MACARIA BISIGNATA See 249.
- 254 Otherwise, venter usually not striped. 255.
- 255 Stripes all white. 256.
255 Stripes white and yellow. 258.
255 Stripes yellow with a bright orange stigmatal.
- TISSUE M. TRIPHOSA DUBITATA *Buckthorn*
- 256 A subdorsal and a broken lateral; or with other lines, the subdorsal always the strongest.
MESOLEUCA HERSILIATA
- 256 Two broad lateral bands. 257.
256 Three narrow lateral lines.
- ARCTIC WINTER M. OPEROPHTERA BOREATA *Birch*
- 256 Similar, with one stripe continued onto head.
EUFIDONIA NOTATARIA *White Pine*
- 256 Darker above, paler below. Head unmarked, a dorsal and one or more white laterals.
ORTHOFIDONIA VESTALIATA *Wild Cherry*
- 257 White addorsal shades.
MELANOLOPHIA CANADARIA *Spruce*
- 257 No white addorsal shades.
PHILOBIA ENOTATA *Lettuce*

258 Dull white dorsal, dull yellow lateral, and fragments of lines brown.

PHIGALIATITEA *Elm, Apple, etc.*

258 A yellow stigmatal. 259.

258 A yellow subdorsal.

THREE-SPOTTED FILLIP HETEROPHELPS TRI-
GUTTATA

Maple

258 Several yellow laterals. *Psysostegania pustularia*. See 232.

259 Upper white stripes continuous, body red.

CYMATOPHORA FRUNNEATA. See 230.

259 Upper white stripes faint and broken.

HELIOMATA CYCLADATA *Locust Tree*

260 Red-brown on sides. 261.

261 Whitish below, front of body swollen and flattened.

FIR-NEEDLE INCH-WORM TEPHROCLYSTIS LUTEATA *Fir*

261 Yellow below.

SELIDOSEMA HUMARIUM *Acacia*

261 Yellow-green below, a black spot on joint 5.

CLEORA PAMPINARIA *Pear*

262 Effect yellowish or reddish-brown. 263.

262 Pale yellow, mottled with black.

TULIP TREE BEAUTY M. EPIMECIS VIRGINARIA *{ Tulip Tree*

262 Effect grayish or greenish-brown. 264.

262 Gray. 265.

263 Dark brown and orange.

EOIS SUAVATA (Fla.) *Randia*

263 Yellow brown, with black tubercles?

GONODONTIS OBFIRMARIA *Blueberry*

264 Flesh color with greenish and brownish mottling.

THE BEGGAR EUDULE MENDICA *Violet*

264 Green and brown, forming subdorsal triangular shades.

HELIOMATA CYCLADATA *Locust Tree*

264 Dull dark-green.

GYPSOCHROA SITELLATA *Pisonia*, etc.

264 Dull brown, with some reddish shades.

PINE MEASURING-WORM PARAPHIA SUBATOMARIA *Pine*

264 Mottled with dark on green or brown.

NOVEMBER M. EPIRRITA DILUTATA *Trees*

265 Mottled with fine longitudinal stripes.

LEPTOMERIS QUINQUELINEARIA *Low plants*

265 Bark gray with white black-edged rectangles on sides of segments. *Paraphia subatomaria*. See 264.

266 Striped.

STOUT POPLAR SPAN-WORM LYCIA URSARIA *Poplar*

266 A dark dorsal line.

GONODONTIS HYPOCHRARIA *Apple*

266 Entirely mottled.

GONODONTIS DUARIA *Wild Cherry*

267 Three slanting white stripes on each, of joints 6 to 9; joints 4 and 5 much swollen.

CALOTHYSANIS AMATURARIA *Polygonum*

267 Series of black slanting bars, brown, white mottled on sides.

COSYMBIA LUMENARIA *Sweet Fern*

COSYMBIA MYRTARIA *Sweet Fern*

267 Slanting pale subdorsal stripes, with a dark spot above them, mottled.

CHICKWEED GEOMETER HÆMATOPIS GRATARIA *Herbs*

268 White crescents above and below the spiracles.

ARGENT AND SABLE; SPEAR-MARK

RHEUMAPTERA HASTATA *Birch, Myrica*

268 No such white crescents, tubercles i and ii white.

SMALL ARGENT AND SABLE RHEUMAPTERA TRISTATA *Galium*

268 No white spots, white lines and red brown stigmal band.

HYDRIOMENA SORDIDATA *Willow, Thorn, etc.*

SATYRS, ETC.

269 Branching spines on head. *Emperor B., Chlorippe.* 270

269 Smooth spines on head, spines usually red. *Satyrs.* 273.

269 Head angled. *Satyrs.* 274.

269 Head regularly rounded, normal. *Satyrs.* 275.

- 270 Spines flattened and leaf-like, no special spinule at end.
 BROWN EMPEROR CHLORIPPE CLYTON *Hackberry Tree*
 270 Spines cylindrical. 271.
- 271 No strong spinules on sides of head spines. 272.
 271 Two strong spinules on sides of head spines, as strong as the two at tip.
 CHLORIPPE FLORA (Fla.) *Hackberry*
 272 Spines hardly $\frac{3}{4}$ length of head.
 GRAY EMPEROR CHLORIPPE CELTIS *Hackberry*
 272 Spines full $\frac{3}{4}$ length of head.
 CHLORIPPE ALICIA *Hackberry*
- 273 Head with spines, twice as high as broad.
 THE EYED BROWN, MANY-EYED SATYR
 SATYRODES CANTHUS *Grass*
 273 Head with spines, half higher than broad.
 PEARLY EYE ENODIA PORTLANDIA *Grass*
 273 Similar, a black stripe down face.
 NEONYMPHA GEMMA *Grass*
- 274 Angles of head brown, body striped.
 GEORGIAN SATYR NEONYMPHA PHOCION *Grass*
 274 Body striped, green, head yellow-brown.
 CISSIA SOSYBIUS *Grass*
 274 Angles of head dull white, body with slanting marks.
 COMMON WOOD NYMPH, LITTLE WOOD SATYR.
 CISSIA EURYTUS *Grass*
- 275 Stripes broad and somewhat broken. *Æneis*. 276.
 275 Stripes very narrow and continuous, a dark dorsal and light stigmatal.
 BLUE-EYED GRAYLING. CERCYONIS ALOPE *Grass*
- 276 Stripes are a broken dorsal and 2 continuous laterals.
 ARCTIC SATYR CENEIS JUTTA *Sedges*
 276 Stripes are a broken subdorsal and continuous dorsal and stigmatal. 277.
 CENEIS NORNA *Sedges*
- 277 White Mountains of New Hampshire, *White Mountain B.*
Æ. n. semidea.
 277 Mt. Katahdin, Me. *Æ. n. katahdin.*

SKIPPERS

278 Upper part of head rounded or rectangular, distance between two highest points greater than width of clypeus.

Hesperiinae. 279.

278 Upper part of head tapering, summits nearer together.
Pamphilinae. 291.

279 Head as high as broad, and distance between summits less than half width of head; clypeus carinate, and cervical shield always present. 280.

279 Head broader; cervical shield weaker, summits farther apart. 284.

280 Skin smooth, yellow spots on lower part of face. 281.

280 Skin granulated, yellow spots of face rare. 282.

281 An orange subdorsal stripe

LONG-TAILED SKIPPER EUDAMUS PROTEUS *Bean, Clitoria*

281 Fine transverse green and yellow stripes

SILVER-SPOTTED SKIPPER EPARGYREUS TITYRUS *Locust F.*

281 White, frosted.

ERYCIDES BATABANO (Fla.) *Mangrove*

281 Red, with yellow transverse stripes. *E. batabano*, young.

282 Collar half width of head.

THE HOARY EDGE ACHALARUS LYCIDAS *Locust F.*

282 Collar shorter. 283.

283 Collar edged in front with orange or red.

NORTHERN CLOUDY-WING THORYBES PYLADES *Bush Clover*

283 No bright color on collar.

SOUTHERN CLOUDY-WING THORYBES BATHYLLUS *Bush Clover*

284 Head nearly rectangular, white with black spots.

ERYCIDES AMYNTAS (Fla.)

284 Head rectangular, cervical shield complete. *Thanaos*, the *Dusky-wings*. 285.

284 Head rounded, cervical shield narrow. 288.

285 Thoracic shield black. 286.

285 Thoracic shield pale, inconspicuous. 287.

- 286 Head black, with pale lines in upper part.
THANAOS LUCILIUS *Columbine*
- 286 Head red-brown, with faint pale lines.
THANAOS PERSIUS *Willow, Poplar*
- 286 Head yellow, with spots at edges.
THANAOS JUVENALIS *Lathyrus, Apios*
- 287 Head blackish with faint spots, body striped.
THANAOS MARTIALIS *Wild Indigo?*
- 287 Head red-brown or yellowish, body not much striped.
SLEEPY DUSKY-WING THANAOS BRIZO *Wild Indigo? Galactia?*
- DREAMY DUSKY-WING THANAOS ICELUS *Poplar*
- 288 Rows of scattered longer hair. *Hesperia.* 289.
- 288 Hair all alike. *Philosora.* 290.
- 289 Head brown, body striped.
- VARIEGATED TESSELLATE HESPERIA MONTIVAGA { *Mal-*
low, *F.*
- 290 Cervical shield black, distinct, head black, body one-colored.
- THE SOOTY-WING PHOLISORA CATULLUS *Pigweed! Monarda?*
- 290 Cervical shield yellowish and rudimentary, marks similar.
PHOLISORA HAYHURSTII
- 291 Head held horizontal, half higher than wide, tapering a good deal, body generally white powdered. 292.
- 291 Head vertical, about as high as wide, tapering little. 294.
- 292 Head very high and triangular, full-grown caterpillar unknown.
- LEAST SKIPPER ANCYLOXIPHA NUMITOR *Grass*
- 292 Head not very conical at front view, but strikingly so at a side view; head green, body with bands and spots.
- ARCTIC SKIPPER PAMPHILA PALÆMON *Grass (Panicum)*
- 292 Head pale, whitish, body not spotted. 293.
- 293 Head with vertical lines; body unmarked.
- ROADSIDE SKIPPER AMBLYSCIRTES VIALIS *Grass*
- 293 Head without vertical lines, body with dark dorsal.
- PEPPER AND SALT SKIPPER AMBLYSCIRTES SAMOSET *Grass*

294 Clypeus inverted shield shaped; head dark orange; body translucent, with dark spots around spiracles.

BRAZILIAN SKIPPER CALPODES ETHLIUS *Canna*

294 Clypeus higher and triangular, or rounded-triangular. 295.

295 A distinct notch in top of head. 296.

295 No distinct notch in top of head. 297.

FIERY SKIPPER HYLEPHILA PHYLÆUS? *Grass*

296 Head brown.

296 Head black with faint marks, body dull gray-green.

VELVET-SPOTTED SKIPPER HYLEPHILA CAMPESTRIS

297 Body yellow-brown with five sharp, blue-black lines.

LITTLE GLASS-WING EUPHYES VERNA *Grass*

297 Body yellow-brown with faint lines.

THE MORMON ATRYTONE ZABULON *Grass*

297 Body dull blackish or brownish, head dark. 298.

297 Body clear green. 300.

297 Body white powdered or whitish, head black and white. 299.

298 Head black, body with faint lines.

TAWNY-EDGED SKIPPER THYMELICUS CERNES *Grass*

298 Head and body concolorous, unmarked.

CROSS-LINE SKIPPER LIMOCHORES MANATAAQUA *Grass*

299 Body dark at both ends.

SACHEM SKIPPER ATRYTONE LOGAN *Grass*

299 Body faintly striped.

CLOUDED SKIPPER LEREMA ACCIUS *Grass*

300 Cervical shield black, head dark or marked. 301.

300 Cervical shield pale, head pale fuscous.

THE TWIN-SPOT OLIGORIA MACULATA *Grass*

301 Head black or red-brown with several pale lines.

THE WHIRLABOUT THYMELICUS BRETTUS } *Grass (Pas-*
palum)

301 Head pale with a black central bar.

VOLCANIC SKIPPER THYMELICUS ÆTNA *Grass*

301 Head red-brown, black behind.

THE LONG DASH THYMELICUS MYSTIC *Grass*

LEGS LACKING, ETC.

302 Hair-tufted, bearlike, *Nolidæ*. 305.

302 Inconspicuous solitary hairs, *Noctuidæ*. 303.

303 First pair of legs much smaller than the others. 316.

303 Abdominal legs all about equal. 319.

304 First pair of abdominal feet much reduced. 321.

304 First two pairs of abdominal feet much reduced. 317.

304 Feet all about equal. 331.

304 First three pairs of abdominal feet much reduced, in regular progression.

FIRSTBORN GEOMETER BREPHOS INFANS *Birch, Poplar*

Nolidæ

305 Every other segment darker.

CELAMA MINNA

305 Conspicuous longitudinal stripes.

NIGETIA SORGHIELLA

305 Less conspicuous stripes, or spotted. 306.

306 Upper tubercles black. 307.

306 All tubercles pale. 308.

307 Spotted.

CELAMA TRIQUETRANA *Witch-hazel*

307 Mottled, paler dorsal.

NOLA APERA

308 Spotted.

NOLA OVILLA *Oak*

308 Mottled on sides.

NOLA CLETHRÆ

Twelve Normal Legs

309 Paired subdorsal lappets or enlarged flattened tubercles on middle joints; red and white.

EXYRA SEMICROCEA *Pitcher Plant F*

EXYRA ROLANDIANA *Pitcher Plant F.*

309 Long dorsal lappets on two segments, hind feet raised when resting.

PHIPROSOPUS CALLITRICHOIDES

- 309 No modification. 310.
 309 All tubercles enlarged, green with white stripes.
 PLUSIA BALLUCA
 309 Mottled, brown, tubercles enlarged.
 HOMOPYRALIS MONODIA *Food?*
- 310 Striped, usually green and white. *Plusiini.* 312.
 310 White spots on sides.
 TARACHE DELECTA *Hibiscus*
- 310 Mottled, a white saddle.
 PLUSIODONTA COMPRESSIPALPIS *Moonseed Vine*
 310 Brown, unmarked.
 EUMESTLETA CARMELITA *Gnaphalium*
- 310 Fine longitudinal stripes and black marks below. 311.
 311 Subdorsal stripe of four or six fine lines.
 REMIGIA REPANDA *Grass*
- 311 Subdorsal stripe of confused, partly fused lines.
 CLOVER LOOPING OWLET DRASTERIA ERECHTEA *Clover*
 311 Subdorsal stripe of three distinct lines.
 DRASTERIA CRASSIUSCULA *Clover*
- 312 Red-brown, with yellow stripes.
 SYNGRAPHA HOCHENWARTHI *Parsley F.*
- 312 Green-gray, with yellow stripes.
 SYNGRAPHA DEVERGENS *Herbs*
- 312 Green. 313.
 313 Heavily black powdered.
 AUTOGRAPHA BILOBA
- 313 Plain green, or white frosted. 314.
 314 Green, with yellow stripes.
 EUCHALCIA CONTEXTA *Grass F.*
- GOLD SPOT M. EUCHALCIA FESTUÆ *Herbs*
 314 Green, with greenish-white stripes. 315.
 315 A faint white dorsal.
 AUTOGRAPHA PRECATIONIS *Herbs*

- 315 White addorsals, widening on middle of segments.

AUTOGRAPHA ROGATIONIS *Herbs*AUTOGRAPHA BRASSICÆ *Cabbage F.***Twelve Normal Feet and Two Small Ones.**

- 316 Striped transversely.

GONODONTA UNICA

Papaw

- 316 Fine longitudinal stripes, brown.

EUCLIDIA CUSPIDEA

- 316 Green, a few white longitudinal stripes.

CLOVER HYPENA

PLATHYPENA SCABRA

*Clover***Twelve Normal Feet and Four Small Ones.**

- 317 Green or brownish, white striped. 318.

- 317 Bark-like, gray.
- Catocala*
- , etc. 463.

- 318 Head vertically green and white striped, or with purple.

TARACHE CANDEFACIA

Ambrosia

- 318 Head vertically brown-striped.

CATABENA LINEOLATA

Verbena

- 318 Head mottled.

TARACHE ERASTRIOIDES

*Ambrosia***Fourteen Feet**

- 319 White, semi-transparent, a borer.

SCOLECOCAMPA LIBURNA *Decaying Chestnut Wood*, etc.

- 319 Green or powdered with black. 320.

- 320 A pale addorsal line (above tubercles i and ii).

HOP HYPENA

HYPENA HUMULI

Hop

- 320 No pale addorsal; a pale subdorsal.

ANOMIS EROSA

Urena lobata

ANOMIS EXACTA

Mallow F.

ANOMIS LURIDULA

Cotton, etc.**Fourteen Normal Feet and Two Small Ones.**

- 321 Slender, powerful, with black spots or an irregular line in middle line beneath.
- Catocala*
- , etc. 463.

- 321 Otherwise. 322.

- 322 White stripes, green subdorsally, sides ochre.

PHEOCYMA LUNIFERA

Pine

322 Brownish, mottled. 323.

322 Green, more or less black powdered above.

COTTON WORM ALABAMA ARGILLACEA Cotton

322 Green, white striped.

CRAMDODES TALIDIFORMIS Verbena

322 Brownish, fine dorsal lines, outcurving on middle of segments.

MELIOPOTIS JUCUNDA

323 Hair weak and soft.

EPIZEUXIS ÆMULA Dead Leaves

323 Hair stiff and strong.

EPIZEUXIS AMERICALIS Dead Leaves

LYCÆNIDÆ.

324 Head $\frac{1}{4}$ to $\frac{1}{2}$ width of body, no cervical shield. 328.

324 Head about $\frac{1}{3}$ width of body, a cervical shield. 325.

325 Red with fine pile showing as whitish subdorsal masses.

EUMÆUS ATALA (Fla.) Zamia

325 Whitish, with noticeable pile.

HARVESTER FENISECA TARQUINIUS Mealy Bugs on Alder

325 Otherwise, hair inconspicuous. 326.

326 Bright green with yellow longitudinal stripes.

BANDED ELFIN INCISALIA NIPHON Pine

326 Green, conspicuous slanting dark and pale spots on sides.

OLIVE HAIR-STREAK MITOURA DAMON Red Cedar

326 Dull brownish colors, unmarked.

GRAY HAIR-STREAK, HOP HAIR-STREAK

URANOTES MELINUS Hop

326 Pink spots or an irregular line on back.

CORAL HAIR-STREAK STRYMON TITUS Oak, Cherry

326 Green, with red-brown at sides.

HOARY ELFIN INCISALIA IRUS Plum Fruit

326 Green, otherwise. 327.

326 Carmine red.

BROWN ELFIN INCISALIA AUGUSTUS Unknown

327 Body more or less marked, with slanting lines, etc. *Thecla*.
327a.

327 Head black, slanting lines on sides.

EUPSYCHE M-ALBUM *Linden*

327 Body unmarked, or with more or less of a red dorsal and stigmatal.

COMMON COPPER HEODES HYPOPHLÆAS *Sorrel*

327a Head black.

EDWARDS' HAIRSTREAK THECLA EDWARDSII *Oak*

327a Head green or pale greenish-brown. 327b.

327b Head with a transverse band across whole lower part of face.

STRIPED HAIRSTREAK THECLA LIPAROPS *Trees (Apple F. Oak, etc.)*.

327b Head perhaps infuscated or with a bar across clypeus.
327c.

327c Body tapering strongly on last three or four segments, rear rather broad.

BANDED HAIRSTREAK THECLA CALANUS *Oak, etc.*

327c Body tapering strongly from in front of middle, very narrow at rear.

ACADIAN HAIRSTREAK THECLA ACADICA *Willow*

328 A subdorsal row of longer bristles, three or four to a joint. 329.

328 No such bristles, hair all equal. 330.

329 With brown shadings, head all dark.

TAILED BLUE EVERES COMYNTAS *Buds and Flowers of Low Leguminosæ*

329 Head chestnut, black at edges, body green.

LIGHT BLUE CYANIRIS LADON *Buds and Flowers, mostly Herbs*

330 Pink with distinct oblique lines.

SILVERY BLUE NOMIADES COUPERI *Vicia — Seeds*

330 Green with faint oblique lines.

SCUDDER'S BLUE, PEARL-STUDDED VIOLET

RUSTICUS SCUDDERI *Lupine*

NOCTUID TYPE

331 Small, hair distinct, iv and v close together or united, usually concealed feeders. *Micros*.¹

331 Often medium sized or large, tubercles and hairs often much reduced, rarely concealed feeders; when recognizable iv is always distinct from v. 332.

331 Good-sized borers. 494.

332 Hair stiff, conspicuous, and black, two setæ from iii.

STRIPED FOOTMAN HYPOPREPIA MINIATA *Lichens*

PAINTED FOOTMAN HYPOPREPIA FUCOSA *Lichens*

332 Hair usually very inconspicuous or else pilose. 333

333 Borers, with tubercles often conspicuous, but no distinct markings. 494.

333 Not borers. 334.

334 Concealed feeders, body white with no distinct marks except the tubercles. 494.

334 Otherwise. 335.

335 Dull brownish, without bright marks; mottled, or striped with shades of brown. *Cutworms*. 422.

335 Long, muscular, semi-loopers, usually with black spots on under side of body, bark-like, or rarely striped. *Underwings*, etc. 463.

335 Body all of one color, or somewhat shaded. 336.

335 More or less conspicuously and brightly marked. 338.

336 Green. 337.

336 Dull brownish, or whitish, thin skinned. *Borers*. 494.

336 Black.

DATANA INTEGERRIMA *Walnut*

337 Few-haired, traces of longitudinal lines, and spiracle of joint 11 enormous.

CAPNODES PUNCTIVENA *Eugenia*

337 Few-haired, brown head and shields, cutworm-like.

GLASSY CUTWORM HADENA DEVASTATRIX *Various*

337 Few-haired, active and slender.

YPSIA UNDULARIS *Cornel*

¹ Omitted from tables.

337 Pilose, and black powdered.

MUSTARD WHITE

PONTIA NAPI

Mustard F.

338 Predominant marks are *transverse* lines. 377.

338 Predominant marks are *longitudinal* lines. 383.

338 Incisures and stigmatal yellow; a blue-green semi-looper, with russet head.

SYNEDA GRAPHICA

338 *Oblique* yellow lines; a yellow subdorsal and a yellow line across front of head.

PANAPODA RUFIMARGO *Walnut F.*

338 A lateral longitudinal band formed of transverse lines. 339.

338 Variouslly *irregularly* banded; or spotted. 341.

339 Body pale, except for the rows of transverse bars.

CALPE CANADENSIS *Meadow-rue*

339 Body longitudinally striped. 340.

340 Stripe either side of barred stripe yellow.

ZEBRA CABBAGE WORM MAMESTRA PICTA *Mustard F. etc.*

340 Stripes either side of barred stripe black.

BROWN-HOODED

OWLET

CUCULLIA CONVEXIPENNIS

Goldenrod, etc.

341 Body much swollen about fourth joint and marked with an eyespot. Orange scent-horn may be thrown out from first joint. *Swallowtails.* 342.

341 Body similarly shaped, scent-horns present, a white saddle in the middle. *Swallowtails.* 343.

341 Body humped at rear also, no scent-horns. 344.

341 Body cylindrical or very little swollen. 345.

342 A transverse band between joints 4 and 5 and a figure 10 in the eyespot; turns black-brown when full-fed.

TIGER SWALLOWTAIL PAPILIOGLAUCUS *Cherry, Lilac, etc.*

342 No transverse band; and a *black* eyespot; turns ochre yellow when full fed.

BROAD-WINGED

SWALLOWTAIL

PAPILIO PALAMEDES

Laurus, Orange

342 No transverse band, but there is a large red spot on joint 4; turns ochre yellow.

BLUE SWALLOWTAIL PAPILIO TROILUS *Sassafras*, etc.

343 An inch and a half or more long.

ORANGE PUPPY, GIANT SWALLOWTAIL PAPILIO
THOAS *Orange*, etc.

343 Smaller; the young of all the *Papilios*.

344 A white subdorsal spot on joint 11, no pale dorsal.

OLIGIA VERSICOLOR

344 A white dorsal line, spot on joint 11 indistinct.

GRATEFUL MIDGET OLIGIA GRATA *Violet*

344 A dark dorsal, and black side-spots from joints 4 to 11.

OLIGIA NUCICOLORA *Potato F.*

344 Blackish, with whitish dorsal line, and flesh-colored triangular spots on joints 4 and 5.

RED GROUNDLING PERIGEA XANTHIOIDES

345 Pale, usually yellow, spots. 347.

345 Dark-spotted. 350.

345 Irregular dorsal or subdorsal line or band.

345 Some segments dark dorsally. 351.

345 Curved transverse dark bands on joints 4 and 5.

MAMESTRA ADJUNCTA *Goldenrod*

345 Red and yellow checkered.

CALICO WORM ELLIDA CANIPLAGA *Linden*

345 Subdorsal black spots, more or less triangular, with a broken or complete subdorsal line below them. *Prodenia*. 433.

345 Green, with several rows of dark spots, shaded below with light. 346.

346 Row of white dorsal spots, white predominating in subdorsal ones.

THE JOKER FERALIA JOCOSA *Hemlock*

346 No dorsal spots, subdorsal row tend to fuse into a band.

MAMESTRA TRIFOLII *Herbs*

347 One row of small dorsal spots only.

APATELA HÆSITATA

347 One row of spots only, not dorsal. 348.

347 Many spots, body black. 349.

347 Body green, with white spots on tubercles, and traces of subdorsal and stigmatal lines.

HYPSOROPHA HORMOS *Persimmon*

348 Spots addorsal, close.

APATELA OVATA *Oak, etc.*

APATELA BRUMOSA *Oak, etc.*

348 Red, large trifoliate subdorsal yellow spots.

PSAPHIDIA THAXTERIANUS *White Oak*

348 Spots lateral, moderate.

APATELA INNOTATA *Hickory?*

348 A few white, good-sized stigmatal spots near front end, body mottled.

PSEUDOTHYATIRA CYMATOPHOROIDES. See 459.

349 Spots in regular rows, hind feet upraised.

DATANA MAJOR *Andromeda, Blueberry*

349 Spots mostly on tubercles, yellow; body acutely humped at rear. *Hadena miseloides*. See 408.

349 Spots irregularly scattered, body normal, tubercles noticeable.

XANTHOPASTIS TIMAIS (Fla.) *Pancratium*

350 Many small spots.

THE HEBREW POLYGRAMMATE HEBRAICUM *Tupelo*

350 A few irregularly scattered spots, stout.

GOATWEED EMPEROR ANÆA ANDRIA *Goatweed*

350 Pilose and rather slender, humped at front, a black spot on side near front.

SNOUT B. HYPATUS BACHMANNI *Hackberry*

351 Two segments dark. MELALOPHA. 352.

351 Four segments dark (4, 7, 8 and 11).

APATELA HAMAMELIS *Hamamelis*

351 Joint 4 dark, a lateral black line, and black dorsal marks on all the segments.

GRAY O-MOTH ADITA CHIONANTHI *Fringe-tree*

352 A broad black and orange stigmatal.

MELALOPHA BRUCEI *Willow*

352 No such stigmatal.

MELALOPHA APICALIS *Poplar*

353 Hind feet not used. *Heterocampa*, etc. 354.

MISOGADA UNICOLOR *Sycamore*

355 A white subdorsal line. 356.

356 Dorsal patch diamond-shaped.

356 Dorsal patch broad at front, then constricted, and broad in middle.

357 Head angled on top.

HETEROCAMPA BIUNDATA *Maple, etc.*

357 Head rounded.

HETEROCAMPA OBLIQUA *Oak*

358 Secondary hair present, though sometimes very little, warts
several haired. 359.

358 Secondary hair lacking, upper warts almost always single-haired. 372.

359 Not green or the alternative brown. 360.

359 Green or the alternative brown. 364.

360 A dorsal elevation on joints 4 and 11. 361.

360 A dorsal elevation on joint 11 only.

INTERRUPTED DAGGER APATELA INTERRUPTA *Elm, Apple,*
Plum, Birch

360 No distinct elevated areas. 362.

361 An elevation also on joint 8.

OCHRE DAGGER

DARKISH DAGGER **APATELA MORULA** *Elm, Apple, Linden*

¹ See Introduction, page 51.

- 362 Black with seven yellow longitudinal stripes, like *Datana*.
 APATELA RADCLIFFEI *Plum, Cherry*
- 362 Black, with a broken dorsal red line.
 FORKED DAGGER APATELA FURCIFERA *Cherry*
- 362 Uniform mottled brown, appearing flattened dorsoventrally. 363.
- 363 Warts i and ii dark, contrasting.
 APATELA BETULÆ *Birch*
- 363 Warts i and ii dark, 2 rows of yellow lateral spots.
 UNMARKED DAGGER APATELA INNOTATA *Hickory*
- 363 Warts i and ii pale, not contrasting.
 LOBELIA DAGGER APATELA LOBELIÆ *Oak*
- 364 Olivaceous with darker green patches on joints 4, 7, 8, and 11.
 FROSTY DAGGER APATELA BRUMOSA *Witch Hazel*
- 364 A dark brown dorsal line. 365.
- 364 No dark dorsal line or patches.
 DELIGHTFUL DAGGER APATELA VINNULA *Elm*
- 365 Dorsal line straight and even. 367.
- 365 Dorsal line widened on joints 6 to 11. 366.
- 366 Dorsal band contains a central green patch. 369.
- 366 No such patch. 370.
- 367 Dorsal band continuous. 368.
- 367 Dorsal band broken, obscure, just touching warts i.
 FRAGILE DAGGER APATELA FRAGILIS *Birch, Pyrus*
- 368 Dorsal band reaching to warts ii.
 CHIEFTAIN DAGGER APATELA SUPERANS *Apple F.*
- 368 Dorsal line reaching only to warts i.
 APATELA FALCULA *Hazel*
- 369 The green patch is on joints 8 to 10.
 GRAY DAGGER APATELA GRISEA *Trees*
- 369 The green patch is on joints 6 to 11.
 APATELA TRITONA *Cranberry, Deerberrry, Azalea*

370 Dorsal band widened on joints 7 to 11. 371.

370 Dorsal band widened on joints 7 and 8.

APATELA CLARESCENS *Apple F.*

371 Joint 2 green.

STREAKED DAGGER APATELA LITHOSPILA *Nut trees, Oak*

372 Hairs multiple, segments with five transverse brown bands.

APATELA RETARDATA *Maple*

372 Hairs, single, not enlarged. 374.

372 Hairs single, with subdorsal spatulate ones. 373.

373 Body brown or green.

APATELA AFFLICTA *Oak*

373 Body black, with large white dorsal spots.

APATELA FUNERALIS *Trees*

374 No subdorsal yellow line. 375.

374 A broad yellow subdorsal line.

CONNECTED DAGGER APATELA CONNECTA *Willow*

375 Body uniformly colored. 376.

375 A blackish lateral shade, enclosing a dorsal V-mark on joints 10 and 11.

APATELA MODICA *Oak*

376 With subdorsal cream-colored spots over tubercles i.

APATELA OVATA *Oak, Beech, Chestnut*

376 Without these spots.

APATELA HAMAMELIS *Oak, etc.*

Striped Crosswise

377 A white lateral spot toward rear, stripes black, white, and red. *Alypia*. 382.

377 Yellow spots in one dark band of each joint.

PARSLEY WORM

BLACK SWALLOWTAIL PAPILIO POLYXENES *Parsley F.*

NEWFOUNDLAND

SWALLOWTAIL PABILIO BREVICAUDA *Parsley F.*

377 No spots. 378.

378 White, one yellow band on each segment.

MOFFAT'S SALLOW **SCOPELOSOMA MOFFATIANA** { *Witch Hazel*

378 Five red-brown bands on each joint.

APATELA RETARDATA *Maple*

378 More or less black striped. 379.

379 A heavy black band between joints 4 and 5.

ZEBRA SWALLOWTAIL IPHICLIDES AJAX *Papaw*

379 Evenly striped. 380.

380 One black stripe to each joint. 381.

380 Four black stripe to each joint.

GRAPE EPIMENIS PSYCHOMORPHA EPIMENIS *Grape F.*

380 Six black and one red stripes to each joint

BEAUTIFUL WOOD NYMPH EUTHISANOTIA GRATA *Grape F.*

PEARL WOOD NYMPH EUTHISANOTIA UNIO *Willow Herb*

381 Black stripes on mid-segments.

CLOUDED CRIMSON M. RHODOPHORA GAURÆ *Gaura*

381 Black stripes on incisures.

INGURA DELINEATA *Sweet Gum Tree*

382 Transverse black lines complete.

EIGHT-SPOTTED FORESTER ALYPIA OCTOMACULATA *Grape F.*

382 Transverse lines much broken dorsally, pale color predominates.

SIX-SPOTTED FORESTER ALYPIA LANGTONII *Grape F.*

Longitudinally Striped

383 Stripes lacking on middle segments. *Papaipema*. Young.
516.

383 Stripes lacking on joint 11. 384.

383 Stripes lacking on joints 4 and 11. *Melalopha*. 352.

383 A dark spot on dorsum of 11 and on sides near front ..

PEBBLE PROMINENT DASYLOPHIA ANGUINA

{ Pea F.
Locust

383 Stripes continuous or fused at rear. 385.

384 Joints 11 and 12 with a black net; black and yellow.

HADENA TURBULENTA *Smilax*

- 384 Joint 11 orange; less brilliantly striped.
 WHITE-TIP M. RED-HUMPED
 MAPLE WORM SYMMERISTA ALBIFRONS *Maple*
 384 Joint 11 black, sharply humped
 APATELA RADCLIFFEI. *See* 362.
- 385 Stripes few and narrow; usually green. 386.
 385 Green; white subdorsal, finely black bordered on both sides,
 HOMOHADENA BADISTRIGA
 385 Mottled, with contrasting stigmatal, and black cervical
 shield. 436.
 385 Several stripes. 410.
- 386 Hair quite long, several times as long as thickness of body-
 not tufted, sparse, pale stigmatal stripe.
 NYCTEOLA REVAYANA *Willow*
 386 Black and white-powdered, black fine subdorsal, and a
 white broad stigmatal.
 GRASS-GREEN CUT-WORM NOCTUA LUBRICANS *Various*
 386 Very fine and short dense pile on body. *Butterflies.* 387.
 386 Hair fine and single, inconspicuous. *Moths.* 393.
- 387 Green, with a pale substigmatal running through blue
 segmental spots. 388.
 387 No such blue spots, at least not both sides of stigmatal.
 389.
 388 Powdering in transverse rows.
 CLOUDLESS SULPHUR CALLIDRYAS EUBULE *Cassia*
 388 Powdering scattered.
 LITTLE ORANGE SULPHUR EUREMA NICIPPE *Cassia*
 389 Small dark spots below stigmatal line.
 CALLIDRYAS AGARITHE *Cassia*
 389 Stripes only. 390.
 390 Stigmatal dark green over yellow.
 CALLIDRYAS SENNÆ *Cassia*
 390 Otherwise. 391.
- 391 Pale dorsal and weaker stigmatal.
 CABBAGE B. PONTIA RAPÆ *Mustard F.*
 391 Pale or red stigmatal and weak or no dorsal. 392.

392 Powdered with black.

CLOUDED SULPHUR EURYMUS PHILODICE *Clover*

392 Powdered with black and white.

LITTLE SULPHUR EUREMA EUTERPE *Cassia, Clover*

EUREMA DELIA (Fla.) *Cassia, Clover*

393 Subdorsal rather distinct, dorsal and stigmatal present.

394.

393 Subdorsal broken, punctiform, stigmatal runs above spiracles except on joints 2 and 12, and runs onto anal feet.

GRAPHIPHORA ALIA *Trees, etc.*

393 Subdorsal lacking. 406.

393 Subdorsal present, dorsal or stigmatal lacking. 400.

394 Subdorsal runs up sharply on joint 11 and may joint dorsal.

COPPER UNDERWING AMPHIPYRA PYRAMIDOIDES *Grape F.*

394 Subdorsal straight in its general course. 395.

395 Tubercles i and ii white, contrasting; head black and white.

EVEN-LINED SALLOW IPIMORPHA PLEONECTUSA *Poplar*

395 Tubercles i, ii, and iii white, larva green or with a black shade.

EUSTROTIA CARNEOLA *Yellow Dock*

395 Otherwise. 396.

396 Stigmatal white, single. 397.

396 Stigmatal white, double.

ANGLE-STRIPED SALLOW COSMIA PALEACEA *Birch, Oak*

396 Stripes yellow. 398.

396 Stigmatal white over yellow.

PYRRHIA UMBRA *Ononis*

396 Stigmatal red over white.

MICROCELIA DIPHTEROIDES

397 Slanting line on side of head. *Poaphila.* 397a.

397 No such line, white peppered. 397b.

397a Green with dark stripes, dark beneath.

POAPHILA FLAVISTRIARIA *Scutellera?*

397a Ochraceous gray with dark dorsal and subdorsal.

POAPHILA QUADRIFILARIS *Gossypium?*

397a Dorsum dark with pale subdorsal, venter yellow.

POAPHILA SYLVARUM *Andromeda?*

BROAD ASHEN PINION XYLINA LATICINEREA { Cherry,
Fruits

406 Yellow dorsal and many broken fragments of lines.

CALYMNIA ORINA

Oak

406 No dorsal. 407.

407 Black over white stigmatal and conspicuous orange spiracles only.

AMERICAN SWORD GRASS M.

CALOCAMPA NUPERA

407 Yellow stigmatal only. 408.

408 Body very slender, and tapering to rear.

HERALD M.

SCOLIOPTERMUS LIBATRIX

Willow

408 Body normal in form. 409.

408 Body sharply humped on joint 11, yellow or white, dark-ringed spots on tubercles, and also between i and ii, and before spiracle.

HADENA MISELOIDES

Cat-briar (Smilax)

409 Red dorsal spots.

GLUPHISIA SEPTENTRIONIS

Poplar F.

409 No red dorsal spots.

GLUPHISIA SEVERA

Poplar

410 Brown dorsum, white subdorsal, green below.

CHAMYRIS CERINTHA

Apple

410 Dark dorsum only. *Apatela*. 358.

410 Green, fine black stripes and a broad pale dorsal.

THE ASTEROID

CUCULLIA ASTEROIDES

Goldenrod

410 Finely striped, bark-like.

ANTICARSIA GEMMATILIS

Canavalia

410 Striped in several colors, finely.

FALCATE ORANGE-TIP

SYNCHLÆ GENUTIA

Mustard F.

410 Green. 411.

410 Of other colors, broadly striped mostly in two colors. 413.

411 Green, fine white and yellow stripes, about six on each side.

MAGUSA DISSIDENS (Fla.)

Condalia

411 Striped in two shades of green. 412.

411 Black powdering, blackish dorsal, white lines and strong white stigmatal.

HELIOTHIS PHLOGOPHAGUS

Grindelia squarrosa

DATANA FLORIDANA (Fla.) *Andromeda*

420 Head paler red.

DATANA PALMII

Huckleberry

421 Striped in black and white.

DATANA CONTRACTA

Oak, etc.

421 Black, lines very weak or wanting.

DATANA INTEGERRIMA

Walnut, etc.

Cut-worms,¹ etc.

422 Hair always distinct; tubercles iv and v level. *Epiplemidæ*. 462.

422 Tubercle iv higher up than v; rather slender and active. *Deltoids*. 460.

422 Stout, often greasy-looking, sluggish, depressed, tubercle iv higher than v when distinct. 423.

423 Hind feet little used; a black, clear dorsal line is the distinctest mark, a few subprimary hairs. *Thyatiridæ*. 459.

423 Dorsal pale or not contrasting; hind feet normal. *Cut-worms*. 424.

424 A row of buff dorsal spots, and largely buff on rear end.

UNARMED RUSTIC, VARIEGATED CUTWORM PERIDROMA

MARGARITOSA

424 No buff dorsal spots. 425.

425 White dorsal distinct and contrasting; subdorsal more distinct, but broken; rather brightly mottled.

SEMIOPHORA YOUNGII

425 White lines less distinct, or not contrastingly mottled. 426.

426 With black subdorsal spots (above subdorsal line). 428.

426 Deep blackish; with black marks. 427.

426 Black laterally (below subdorsal line).

FINLAND DART BLACK-LINED CUTWORM BLACK ARMY-WORM

NOCTUA FENNICA

426 No black except cervical shield and perhaps tubercles. 435.

¹ The *Cut-worms* are mostly general feeders, eating at night and hiding on or under the ground by day; where they have this habit, their food is not given in the tables.

- 427 Grayish, with white transverse band on strong segment.
 GREEN-WINGED DART ADELPHAGROTIS PRASINA
- 427 Deep brown.
 WHEAT CUT-WORM, GREAT GRAY DART PERIDROMA OCCULTA
- 428 Conspicuous lateral black spots on joint 12 only. (A9.)
 ANORTHODES PRIMA
- 428 Black spots as large on joints 2 and 3 as on the rest; somewhat triangular and edged with pale below. *Prodenia*. 433.
- 428 Black spots in a row practically wanting on thorax. 429.
- 428 A few irregular black marks on last joints; diamond shaped mottlings.
 SMALL BROWN QUAKER ORTHODES VECORS
- 429 Spots about equally strong from joints 4 to 11, but entirely lacking on thorax.
 W-MARKED CUT-WORM NOCTUA CLANDESTINA
- 429 Spots smaller toward front in regular progression. 430.
- 430 Dark fuscous, pale below; spots shaded; dorsal and subdorsal lines distinct, pale.
 BARATHRA CURIALIS
- 430 Spots defined, or very pale. 431.
- 431 Pale translucent gray; dorsal W-mark distinct or spots tend to be F-shape.
 DIMMOCK'S MAMESTRA MAMESTRA RADIX
- 431 Darker. 432.
- 432 Tawny; black spots spatulate and long, usual lines distinct.
 DOTTED CLAY M. NOCTUA BAJA
- 432 Spots are right triangles; lines faint.
 BLACK-LETTER DART, SPOTTED CUT-WORM
 NOCTUA C-NIGRUM
- 432 Lines somewhat visible; grayish, fine black powdering; dorsum dark like a series of diamonds or strong W-marks.
 MAMESTRA CANADENSIS
- 432 Lines distinct; black spots linear, toward rear and almost failing, a series of elliptic dorsal shades, crossed by the pale dorsal line.
 PINK-SPOTTED DART NOCTUA BICARNEA

433 Strong yellow dorsal and stigmatal lines.

POKEWEED WORM PRODENIA ERIDANIA *Pokeweed*

433 No dorsal, and weak substigmalal lines. 434.

434 A strong pale subdorsal line just below the black triangles.

COTTON CUT-WORM PRODENIA ORNITHOGALLI *Various*

434 Subdorsal pale line broken into bars below the triangles.

SPIDERWORT OWLET PRODENIA COMMELINÆ *Various*

435 Cervical shield black, contrasting, crossed usually by conspicuous white subdorsal lines, *but not by dorsal*; substigmatal conspicuous and pale. 436.

435 Cervical shield usually with dorsal and subdorsal lines
equally strong. 441.

436 Substigmatal line broad and contrasting. *Scopelosoma*.
437.

436 Substigmal narrow and fails at the rear.
RED-WINGED SALLOW JODIA RUFAGO Oak

437 Dull greenish dorsally, sides richer colored. 440.
437 Blackish or rich purple-black. 438.

438 Stigmatal shaded with orange-yellow.
SCOPELOSOMA TRISTIGMATA *Oak*

438 Stigmatal shaded with greenish or reddish. 439.

439 Rich velvety purple-black, dorsal and subdorsal lines indistinct.

WALKER'S SALLOW SCOPELOSOMA WALKERI *Oak*
439 Duller blackish, subdorsal broken, but quite distinct. `

440 Greenish white with olive shades.

LOST SALLOW SCOPELOSOMA DEVIA *Oak*

440 Dark olive green. SCOPELOSOMA SIDUS Oak

441 Deep blackish, powdered; tubercles elevated, variously striped, rather contrasting.

FALL ARMY-WORM LAPHYGMA FRUGIPERDA *Grass F.*
441 Vaguely mottled or otherwise striped. 442.

442 Cervical shield contrasting, shining, black, with pale ordinary lines, mottled.

MAMESTRA DETRACTA

442 Cervical shield similar, brown, strong pale stigmatal, and weaker dorsal, pinkish.

PINK-BARRED SALLOW XANTHIA FLAVAGO Willow

442 Cervical shield less contrasting. 443.

443 Striped. 444.

443 Dorsum pale, subdorsal region with three vague dark bands

UFEUS PLICATUS

443 Diagonal mottlings, suggesting diamonds, *W*'s, etc. 450.

443 Wavy, indistinct bands in dorsal region.

GRAPHIPHORA OVIDUCA

443 Vague rectangular markings, dorsum somewhat paler. 458.

444 Dorsal line pale, flanked by black shades, rest of body much redder. HADENA APAMIFORMIS.

444 Reddish, lines punctiform, clear and white. 445.

444 Considerably dark-striped. 446.

445 Stripes not black-bordered.

FLAME-SHOULDERED DART NOCTUA PLECTA

445 Stripes narrowly black-bordered.

UNCIVIL DART PERIDROMA INCIVIS

446 Stripes clear and defined. 447.

446 Stripes shaded. 448.

446 Four dark stripes separated by three pale ones on each side.

BRONZE CUT-WORM NEPHELODES MINIANS

446 Three dark stripes separated by two pale lines, on each side.

CHECKERED RUSTIC PARAGROTIS TESSELLATA

447 Clay color, stripes narrow and all of the same shade of brown. 449.

447 Broad dorsal and very dark stigmatal.

WHEAT ARMY-WORM HELIOPHILA ALBILINEA Grass F.

448 A distinct buff lateral band above the dark stigmatal.

ARMY-WORM HELIOPHILA UNIPUNCTA Grass F.

448 Traces of this buff band; lightest part of addorsal region is two very narrow vague pale bands.

FALSE WAINSCOT M. HELIOPHILA PSEUDARGYREA *Grass F.*

448 Buff band absent; subdorsal region broadly shaded.

HELIOPHILA PHRAGMATIDICOLA *Grass F.*

449 Smooth.

HELIOPHILA LUTEOPALLENS *Grass F.*

449 Tubercles elevated.

GRANULATED CUT-WORM FELTIA MALEFIDA

450 Paler dorsal band about two thirds as wide as diameter of caterpillar; edged below by a distinct dark lateral.

GREEN-SPOTTED MAMESTRA, SMALL WHITE-BRISTLY CUT-WORM
MAMESTRA RENIGERA

450 Paler dorsal band about half as wide as diameter of caterpillar. 454.

450 Dorsum pale, filled in with a row of diamond shaped marks, thorax black-brown.

BRIDLED MAMESTRA MAMESTRA LOREA

450 Dorsum not pale. 451.

451 Bright brown, dorsal line distinct, white, dark-edged; substigmatal white and oblique lines on sides.

BIRD'S WING M. DIPTERYGIA SCABRIUSCULA *Various*

451 A series of distinct darker dorsal diamonds.

STUDIED MAMESTRA MAMESTRA MEDITATA

451 Subdorsal oblique lines filled in between, forming vague triangles with the apex backward.

ORTHOSIA BICOLORAGO *Maple*

451 Two sets of subdorsal obliques, forming a W-mark; pale. 452.

451 Darkish; marks all mottled looking; dorsal quite distinct.

GREATER RED DART RHYNCHAGROTIS ALTERNATA

451 Yellow-brown; dorsal obliques slanting up and back only; lines distinct, white, dark bordered.

DOT AND DASH SWORD-GRASS M. CALOCAMPA CURVIMACULA

452 Dorsal absent; tubercle ii of joint 11 white, dark-edged, rather conspicuous.

SMALL ANGLE SHADES M. EUPLEXIA LUCIPARA { *Viburnum,*
Birch, etc.

452 Dorsal present, broken, tubercles ii all concolorous. 453.

452 Dorsal present, complete at rear, ii concolorous.

SIGMOID DART EUERETAGROTIS SIGMOIDES

453 Subdorsal obliques connected across middle of 11 by a dark cross-bar.

SPECKLED CUT-WORM MAMESTRA SUBJUNCTA

453 Joint 11 with a W-mark as on the other joints.

LARGE ANGLE SHADES M. TRIGONOPHORA PERICULOSA

454 A series of subdorsal triangles are the darkest marks; sometimes a series of dark dorsal diamonds present.

MAMESTRA OLIVACEA

454 No such subdorsal triangles. 455.

455 Stigmatal line reduced to a row of vague spots; pale dorsal region quite contrasting, but all marks blurred.

DINGY CUT-WORM FELTIA JACULIFERA (and HERELIS)

FELTIA SUBGOTHICA

455 Distinct white substigmatal on thorax; yellow or dark brown; marks quite contrasting.

HYPPA XYLINOIDES

455 Substigmatal continuous or wanting. 456.

456 A distinct row of shaded buff subdorsal spots.

CARADRINA MIRANDA

456 No such spots. 457.

457 Brown; stigmatal wavy, black, continuous; large.

FLUID MAMESTRA MAMESTRA LATEX

457 Pale translucent gray, marks faint; small.

CIVIL RUSTIC CARADRINA EXTIMIA

458 Tubercles of mesothorax form a distinct transverse row of black dots.

CABBAGE CUT-WORM FELTIA ANNEXA

Tubercles mostly black, but those in the pale dorsal band inconspicuous. PARAGROTIS DIVERGENS.

458 Tubercles concolorous.

THE REAPER, DARK-SIDED CUT-WORM

PARAGROTIS MESSORIA

- 459 Dorsum dark, venter pale, rather contrasting.
 BUFF ARCHES M. HABROSYNE SCRIPTA *Blackberry, etc.*
- 459 Dorsum regularly shading into the paler venter.
 PSEUDOTHYATIRA CYMATOPHOROIDES *Oak*
 (usually comes under 348)
 PSEUDOTHYATIRA EXPULTRIX *Oak*
- 460 Dorsal line present. 461.
 460 Dorsal line absent, reticulations broken.
 ZANCLOGNATHA OBSCURIPENNIS *Dead Leaves*
 ZANCLOGNATHA MINIMALIS *Dead Leaves*
- 461 Reddish, first joint blackish; no oblique shades mentioned.
 CHYTOLITA MORBIDALIS *Grass, etc.*
- 461 Yellow and brown, dorsal line strong; oblique shades distinct.
 ZANCLOGNATHA LITURALIS *Dead Leaves*
- 461 Greenish and brown, dorsal line often diffuse; oblique shades distinct.
 ZANCLOGNATHA PEDIPILALIS *Dead Leaves*
- 462 Dorsum dark, black-edged laterally.
 CALLIZZIA AMORATA *Lonicera dioica*
- 462 Dorsum somewhat darker than below; no contrasting line.
 CALLEDAPTERYX DRYOPTERATA *Viburnum*
Catocala, etc., (underwings)
- 463 A short horn on joint 8. 464.
 463 A low ridge or hump on joint 8. 465.
 463 Dorsum not humped, except on joint 11. 473.
- 464 Below pale green with black spots.
 CATOCALA GRYNEA *Apple.*
- THE LITTLE SISTER CATOCALA FRATERCULA *Oak*
- 464 Below pale green with red-brown marks.
 HAWTHORN UNDERWING CATOCALA CRATÆGI *Thorn*
- 464 Below pink, with black spots.
 PLUM-TREE CATOCALA, DARK RED UNDERWING
 CATOCALA ULTRONIA *Wild Cherry F.*
- 464 Color below uncertain; very large, dark gray.
 SCARLET UNDERWING CATOCALA COCCINATA *Oak*

465 With black spots below. 466.

CATOCALA CARA Willow

466 Head normal, rounded. 468.

HYPOGRAMMA ANDROMEDÆ *Andromeda*

468 Head not black marked. 471.

LITTLE UNDERWING **CATOCALA MINUTA**

CATOCALA MICRONYMPHA *Thorn*

469 Bright blue-green below. 470.

470 Fourth and eighth joints white marked, small.

POLYGAMIST CATOCALA POLYGAMA *Thorn*

471 Pink below; dark brown.

PINK UNDERWING CATOCALA CONCUMBENS Willow

OLD-WIFE UNDERWING CATOCALA PALÆOGAMA *Hickory*

472 No orange spots.

THE BETROTHED CATOCALA INNUBENS } *Walnut? Honey*
 } *Locust?*

473 Forward projecting swellings toward top of head; whitish with black spots below.

CATOCALA AMICA

Oak

473 Head rounded. 474.

474 Very large, may be 5 inches long, with a pinkish tinge and broad heart-shaped pink spots on several incisures of back; black longitudinal bar on head.

BLACK WITCH

EREBUS ODORA

Cassia, etc.

474 Not quite so large, or moderate; various marks. 475.

474 About 2 inches long; rows of transverse spots are the most distinct marks.

ALLOTRIA ELONYMPHA

Walnut

475 Brownish below, mottled above. 486.

475 White or bright colored below. 476.

476 Sharp clear longitudinal stripes.

CATOCALA AMESTRIS

Amorpha fruticosa

476 Many sharp clear transverse stripes.

MAGDALEN UNDERWING

CATOCALA ILLECTA

Unknown

476 Mottled. 477.

477 Head black marked. 478.

477 Head more than half black; ground color below salmon color.

THE PENITENT

CATOCALA PIATRIX

Walnut F.

477 Head all pale, — brown, orange, white. 483.

478 Black forms a band on sides and across top of head. 479.

478 Black spot only, near eyes. 482.

478 Black bands on sides of head up to top; white below.

YELLOW-GRAY UNDERWING

CATOCALA RETECTA

479 Black spots on under side wanting.

SERENE UNDERWING

CATOCALA SERENA

Hickory

479 Black spots below present, often confluent into a line. 480.

480 Ground color pale, spots fused into a line. 481.

480 Ground color below white, spots black and orange, pale olive subdorsal marks on incisures between joint 5, 6, and 7.

WIDOW UNDERWING

CATOCALA VIDUA

Hickory, Oak

480 Ground color bluish white, pink and black spots.

MOURNING UNDERWING CATOCLATA FLEBILIS *Hickory*

480 Ground color purplish pink; body appears distinctly striped. large.

ILIA UNDERWING CATOCALA ILIA *Oak*

481 Black line on head weak, irregular, sometimes lost.

BAY UNDERWING CATOCALA BADIA *Walnut F.*

481 Black line on head broad, even edged.

THE CONSORT CATOCALA CONSORS *Hickory*

482 Ground color white, spots red-brown.

JUDITH CATOCALA JUDITH *Hickory*

482 Ground color pink; spots black.

OBSCURE UNDERWING CATOCALA OBSCURA *Hickory*

483 Head vertically striped in orange and white (stripes somewhat broken). 484.

483 Head mottled or netted; marks tend to form dark patches on vertex and in front of eyes. 485.

484 Ground color below yellow.

THE WAYWARD NYMPH CATOCALA ANTINYMPHA { *Sweet*
Fern

484 Ground color beneath whitish, spots fuse into a line. *Catocala badia*. See 481.

484 Orange below; whole larva very warm tinted.

THE LITTLE WIFE CATOCALA MULIERCULA *Myrtaceae*

485 Ground color pink below.

THE BRIDE CATOCALA NEOGAMA *Walnut F.*

485 Ground color white below.

WIDOWED UNDERWING CATOCALA VIDUATA *Hickory*

486 Vaguely mottled, no black marks below.

HOMOPTERA OBLIQUA *Pine*

486 A distinct tubercle (ii) on subdorsum of joint 5. 487.

486 Bark-like, the usual spots below connected, larger.

THE MARRIAGEABLE MAID EUPARTHENOS NUBILIS *Locust*

487 Tubercle large and black, a black crescent on 11.

MAPLE SEMI-LOOPER PARELLELIA BISTRIARIS *Maple*

487 Tubercle small and white, no black crescent. 488.

488 Whitish subdorsal band interrupted on the tuberculate joint.

PSEUDANTHRACEA CORACIAS *Oak*

488 No whitish subdorsal. 489.

489 Tubercle much larger than tubercle i of the same joint, contrasting.

HOMOPTERA CALYCANTHATA *Birch*

489 Tubercles ii less than twice as large as i, both white.

LUNATE SIMILAR-WING HOMOPTERA LUNATA } *Apple, Raspberry, etc.*

SACK-BEARERS

490 Long clubbed setæ on head.

MELSHEIMER'S SACK-BEARER CICINNUS MELSHEIMERII *Oak*

490 No clubbed setæ on head.

SCALLOPED SACK-BEARER LACOSOMA CHIRIDOTA *Oak*

491 Sticks, etc., fastened on crosswise.

ABBOT'S BAG-WORM OIKETICUS ABBOTII *Citrus, etc.*

491 Sticks, etc., fastened on lengthwise. 492.

491 Uses lichens in fine fragments and feeds on them.

CHALIA RILEYI *Lichens*

492 Eats lichens, etc., on trunk of tree.

EURCYTTARUS CONFEDERATA *Lichens*

492 Eats leaves. 493.

493 Case about $\frac{1}{2}$ inch long when grown.

PLATÆCETICUS GLOVERI *Citrus*

493 Case over an inch long when full grown.

EVERGREEN BAGWORM THYRIDOPTERYX EPHEMERÆ-

FORMIS *All Trees*

BORERS

494 With extra tubercles (four above spiracles and three below besides on leg-base). *Hepialidæ*. 511.

494 No extra tubercles, normally three hairs above and three below spiracles. 495.

- 494 No primary hair, fine pile.
 YUCCA BORERS MEGATHYMUS YUCCÆ *Yucca*
 METHYMUS COFAQUI *Yucca*
- 494 Tubercles all absent, no secondary hair. *Ægeriidae*. 496.
 495 Tubercles iv and v united. *Cossidae* and *Ægeriidae*. 496.
 495 Tubercles iv and v distant. *Noctuidæ*. 512.
- 496 Boring in trees. 497.
 496 Boring in shrubs. 503.
 496 Boring in vines and creepers. 504.
 496 Boring in herbaceous perennials. 507.
 496 Inquilines in borings of other insects. 508.
- 497 Under bark of trunks high above ground, or of branches.
 501.
- 497 Under bark of base of trunk and of main roots. 502.
 497 In solid wood of trunks and branches. 498.
 497 In solid wood of base of trunk and large roots. 500.
- 498 Large, 2 to 4 inches long. *Cossidae*. 509.
 498 Small, rarely over 1½ inches long. *Ægeriidae*. 499.
- 499 Ash. PODOSESIA SYRINGÆ.
 499 Oak. MEMYTHRUS SIMULANS.
 499 Poplar. MEMYTHRUS DOLLII.
 499 Poplar and willow. MEMYTHRUS TRICINCTUS.
- 500 Persimmon. SESIA UROCERIFORMIS.
 500 Ash, Alder. MEMYTHRUS ASILIPENNIS.
 500 Willow and poplar. ÆGERIA APIIFORMIS.
 500 Willow. ÆGERIA TIBIALIS.
- 501 Maple. SESIA ACERNI. *Maple Borer*.
 SESIA CORNI
- 501 Apple, pear. SESIA PYRI.
 501 Dogwood, oak, chestnut. SESIA SCITULA.
 501 Cherry, plum, June berry. SESIA PICTIPES.
- 501 Pine and spruce. PARHARMONIA PINI. { *Pine Æge-*
rian.
- 502 Stone-fruits. SANNINOIDEA EXITIOSA. *Peach borer*.
 503 In solid wood, — of lilac. PODOSESIA SYRINGÆ.

503 In pith of stems, — Currant, Gooseberry.
CURRENT BORER **SESA TIPULIFORMIS**

503 In roots, — Blackberry and Raspberry.
 STRAWBERRY BORER *SESIA RUTILANS*
 BLACKBERRY BORER *BEMBECIA MARGINATA*

504 In the stems. 505.

504 In the roots. 506.

505 Squash, pumpkin, and others of family.
SQUASH VINE BORER MELITTIA SATYRINIFORMIS

506 Grape. MEMYTHRUS POLISTIFORMIS

506 Clematis. ALCATHOË CAUDATA

507 In roots of strawberry. SESIA RUTILANS { *Strawberry*
borer.

507 In stems of Eupatorium (Thoroughwort).
SESIA BASSIFORMIS

508 In an oak-gall (*Andricus cornigerus*).
 SESIA SCITULA
 SESIA RUBRISTIGMA

508 In an oak-gall. *SESIA SAPYGÆFORMIS* (Fla.)

508 Gall of *Saperda concolor*.
 SESIA ALBICORNIS
 MEMYTHRUS TRICINCTUS

509 Cervical shield wider than height of head, crested in back; no shield on meso- and metathorax.

LEOPARD M. ZEUZERA PYRINA *Pear*, etc.

509 Cervical shield narrow, flat, smaller; shields on joints 2 and 3. 510.

510 Plate of tubercle iii of metathorax much smaller than that of ii a+b.

LOCUST BORER PRIONOXYSTUS ROBINEÆ } *Locust, Poplar,*
Oak

LESSER OAK CARPENTER PRIONOXYSTUS MAC-
MURTREI *Oak*

510 Plate of tubercle iii full as large as that of ii a + b.
 COSSUS CENTERENSIS *Poplar*

518 Anal plate smooth, as are all the plates. 519.

519 iv on joint 10 high, opposite spiracle. 524.

519 Tubercle iv normal on joint 10, lower than spiracle. 520.

520 Characters doubtful.

PAPAIPEMA HARRISII

Parsley F.

520 Preanal plate single.

STALK BORER

PAPAIPEMA NITELA

Various

520 Preanal plate paired. 521.

521 Tubercle i on abdomen considerably enlarged, ii nearer normal. 522.

521 Tubercles i and ii both small and equal.

PAPAIPEMA INQUÆSITA

Sensitive Fern

522 Dorsal plate on mesothorax. 523.

522 Four small dorsal plates on metathorax also.

PAPAIPEMA CATAPHRACTA

Rhubarb, etc.

523 Preanal plates about equal to plates i and ii of joint 11.

PAPAIPEMA MARGINIDENS

Cicuta

523 Preanal plates much larger and approximate.

PAPAIPEMA IMPECUNIOSA

Aster

524 Preanal plate single; four small plates on metathorax.

PAPAIPEMA PURPURIFASCIA

Columbine, Loosestrife

524 Preanal plates paired, no plates on metathorax.

PAPAIPEMA CIRCUMLUCENS

525 Head white, with black spots.

PEACH BLOSSOM M.

EUTHYATIRA PUDENS

Cornel

525 Head all one color, dull. 526.

526 Color —, bores in stems of reeds.

NONAGRIA SUBCARNEA (Borer)

Reeds

526 Body mainly translucent white. 527.

526 Body pale smoky, head tawny.

YELLOW-HEADED CUT-WORM

HADENA ARCTICA

A Cutworm

526 Dark smoky, head and shields black.

HADENA LATERITIA

A Cutworm

527 Clear white lateral stripes, three on each side.

PARAGROTIS DETERSA *A Cutworm*

527 Red dorsal shade.

MACRONOCTUA ONUSTA (Borer) *German Lily*

527 No marks, except usual shields.

UNSATURATED SALLOW GLÆA INULTA (Nest maker?) *Viburnum*